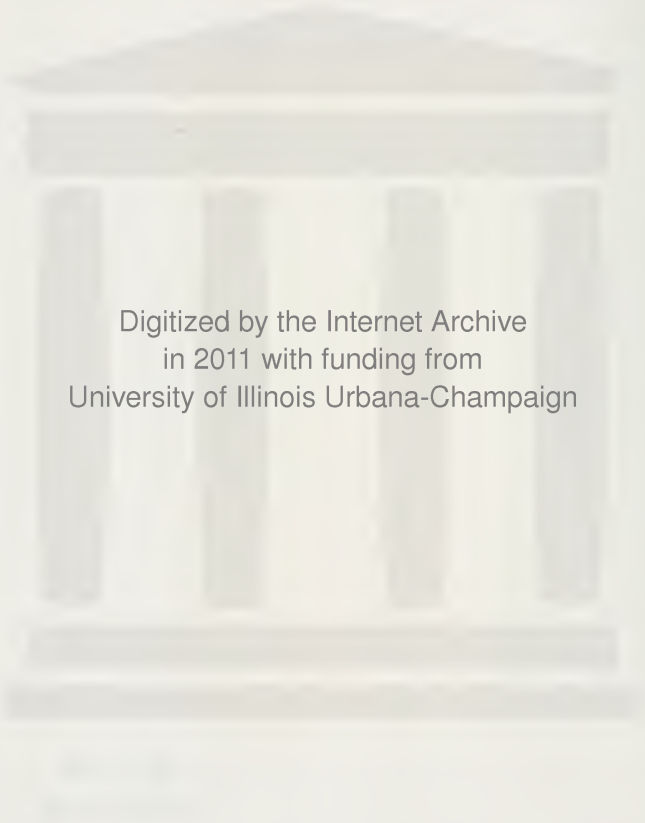

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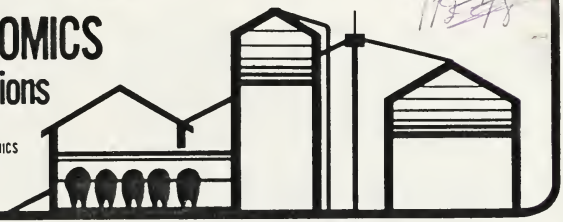

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Soybeans	[illegible]	5.30	5.10	5.10	5.25
	Moderate	5.75	5.75	5.90	6.00
	High	7.00	7.42	7.86	8.34
Milk	Weak	11.60	11.10	10.10	9.10
	Moderate	12.20	12.20	12.20	12.20
	High	14.00	14.00	14.50	14.50
Cull cows	Weak	32.00	32.00	32.00	32.00
	Moderate	37.00	37.00	37.00	37.00
	High	42.00	42.00	42.00	42.00
Veal calves	Weak	52.50	52.50	52.50	52.50
	Moderate	72.50	72.50	72.50	72.50
	High	92.50	92.50	92.50	92.50

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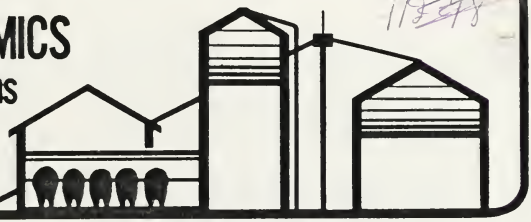

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	Moderate	37.00	37.00	37.00		37.00
	High	42.00	42.00	42.00		42.00
...eal calves	Weak	52.50	52.50	52.50		52.50
	Moderate	72.50	72.50	72.50		72.50
	High	92.50	92.50	92.50		92.50

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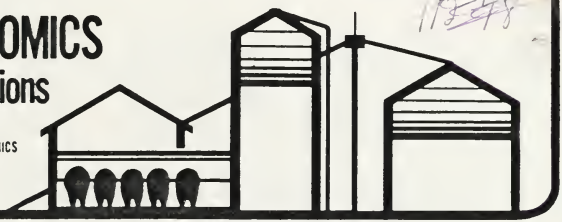

January 1986

86-1/Which Illinois Dairy and Cattle Feeding Farms Can Survive?

Farm Economics Facts and Opinions 85-16 examined the impact of commodity prices, tenure pattern, and financial leverage on the future survival and prosperity of Illinois cash-grain and hog farms. In this article, we continue that analysis by projecting the financial situations of two other major types of Illinois farms: dairy and feeder cattle farms.

THE PROJECTED ECONOMIC SITUATION OF DAIRY FARMS

To examine the ability of dairy farms to prosper and survive, we projected their financial situations over the next four years under three different initial debt-to-asset ratios (20, 50, and 70 percent) and three different sets of commodity prices. Table 1

Table 1. Commodity Prices Used to Project the Financial Condition of Illinois Dairy Farms

Commodity	Levels of commodity prices	Year 1986	1987	1988	1989
			dollars		
Corn	Weak	2.15	2.15	2.20	2.25
	Moderate	2.60	2.65	2.70	2.75
	High	3.03	3.21	3.40	3.61
Soybeans	Weak	5.30	5.10	5.10	5.25
	Moderate	5.75	5.75	5.90	6.00
	High	7.00	7.42	7.86	8.34
Milk	Weak	11.60	11.10	10.10	9.10
	Moderate	12.20	12.20	12.20	12.20
	High	14.00	14.00	14.50	14.50
Cull cows	Weak	32.00	32.00	32.00	32.00
	Moderate	37.00	37.00	37.00	37.00
	High	42.00	42.00	42.00	42.00
Veal calves	Weak	52.50	52.50	52.50	52.50
	Moderate	72.50	72.50	72.50	72.50
	High	92.50	92.50	92.50	92.50

shows the commodity prices used for these three economic scenarios.

The simulated dairy farm has 289 tillable acres, with 54 acres owned and 235 acres rented on a 50-50 crop-share basis. Of these acres, 161 are planted in corn, 90 in hay, and 38 in soybeans. The farm operator is assumed to own all dairy facilities and to milk a herd of 56 cows with an annual milk production of 14,356 pounds per cow. All calves not kept for replacement heifers are sold at 200 pounds.

Costs of production are based upon averages for northern and central Illinois dairy farms in the Farm Business Farm Management Association (FBFM). For the scenarios with weak and moderate prices, it was assumed that the costs of production and the value of land remained at their 1985 level. Interest rates were assumed to be 12.5 percent for both operating and capital loans throughout the next four years. Yields were assumed to average 130 bushels per acre for corn, 45 bushels per acre for soybeans, 5 tons per acre for hay, and 18 tons per acre for corn silage.

For the scenario with high commodity prices, all previous assumptions were used except that land values were assumed to grow 6 percent annually because of the much higher commodity prices. In addition, costs of production were assumed to increase 3 percent annually.

Results of the dairy farm simulation are reported in Table 2. According to the scenario with weak prices, a dairy farmer with an initial debt-to-asset ratio of 20 percent generates a small positive amount of net farm income in the first two years, but this income becomes negative in the last two years. Over the four-year period this farmer's net worth will decline moderately, but the debt-to-asset ratio will drop. With an initial debt-to-asset ratio of 50 or 70 percent, however, this same size farm will experience a negative and rapidly deteriorating net farm income and show a significant drop in net worth. Equity capital is totally eliminated under a scenario with weak prices for a dairy farmer with an initial debt-to-asset ratio of 70 percent.

Under the scenario with moderate prices, a dairy farmer with an initial debt-to-asset ratio of 20 percent generates moderate levels of net farm income and experiences some growth in net worth. An initial debt-to-asset ratio of 50 percent will produce a small positive amount of net farm income in all years, but not enough to keep from eroding the initial equity position. Liabilities, however, decrease somewhat faster than net worth; therefore, the debt-to-asset ratio will decline slightly over the period. The highly leveraged operator experiences a significant drop in net worth because of a large negative net farm income each year. It is unlikely that this operation will survive many more years under this scenario.

For the scenario with high prices, a dairy farmer with an initial debt-to-asset ratio of 20 to 50 percent generates good profits and strong growth in net worth. Likewise, the highly leveraged operator generates modest levels of net farm income and a strong growth in equity primarily because of the inflating value of land assumed under this scenario.

THE PROJECTED ECONOMIC SITUATION OF FEEDER CATTLE FARMS

To examine the ability of feeder cattle farms to prosper and survive, we projected their finanacial situations over the next four years under alternative price scenarios and initial debt-to-asset ratios. The simulated feeder cattle farm has 558 tillable acres, with 190 acres owned and 368 acres rented on a 50-50 crop-share basis. Of these acres 423 are planted in corn, 87 in soybeans, and 48 in hay. The farm

Table 2. Projected Financial Situations of Illinois Dairy Farms

Scenario	Initial debt-to-asset ratio 20 percent	50 percent	70 percent
		dollars	
WEAK PRICES			
Net farm income			
1986	12,962	(2,290)	(12,458)
1987	6,642	(9,488)	(20,927)
1988	(3,074)	(20,960)	(33,817)
1989	(5,845)	(26,245)	(40,710)
Net worth			
Initial	325,375	203,359	122,015
1986	323,337	186,069	94,557
1987	317,364	166,488	63,630
1988	303,974	135,528	19,813
1989	288,056	99,283	(30,897)
Ending debt-to-asset ratio	8 percent	68 percent	110 percent
MODERATE PRICES			
Net farm income			
1986	22,731	7,479	(2,689)
1987	20,838	5,929	(5,510)
1988	19,290	4,451	(8,315)
1989	24,515	10,301	(4,026)
Net worth			
Initial	325,375	203,359	122,015
1986	333,106	195,838	104,326
1987	338,302	190,864	88,733
1988	345,921	185,017	70,406
1989	357,643	185,057	56,380
Ending debt-to-asset ratio	7 percent	41 percent	82 percent
HIGH PRICES			
Net farm income			
1986	42,737	27,485	17,317
1987	39,707	27,299	15,860
1988	40,921	30,433	18,028
1989	44,987	37,810	24,218
Net worth			
Initial	325,375	203,359	122,015
1986	359,858	222,590	131,078
1987	383,364	239,564	140,326
1988	413,377	262,783	154,049
1989	445,281	289,149	172,783
Ending debt-to-asset ratio	5 percent	17 percent	49 percent

operator is assumed to own all livestock facilities and to feed out 300 feeder cattle annually. The costs of production are based upon averages for Illinois feeder cattle farms in the FBFM record-keeping program. Crop production costs, yields, and interest rates are comparable to those used in the dairy farm simulations. Prices for corn and soybeans in these simulations are the same as those reported in Table 1. Cattle prices used for the three economic scenarios are listed in Table 3, and the results of the feeder cattle farm simulations are reported in Table 4.

Overall, the projected economic situation of the average feeder cattle farm in Illinois is not good. Under the scenarios with weak and moderate prices, all of the simulated farms experience negative net farm income over the four-year period. This causes a significant drop in net worth, with the highly leveraged operator becoming insolvent in the third year. The operators with an initial debt-to-asset ratio of 20 and 50 percent still have some net worth because their beginning equity position was so strong. In all situations, the debt-to-asset ratio increases because additional borrowing is required to cover the losses as well as family living expenses.

According to the scenario with high prices, the farmer with an initial debt-to-asset ratio of 20 percent will have a modest net farm income each year. Coupled with the inflating value of land, this income will cause a strong growth in net worth and reduce the debt-to-asset ratio. The farmer initially leveraged at 50 to 70 percent will still experience negative net farm income. Due to the inflating value of land assumed under this scenario, however, the operator with an initial debt-to-asset ratio of 50 percent will have a slight growth in net worth. The highly leveraged operator will experience losses great enough to cause a significant drop in net worth and an increase in the debt-to-asset ratio.

Table 3. Cattle Prices Used to Project the Financial Condition of Illinois Feeder Cattle Farms

Commodity	Levels of commodity prices	Year			
		1986	1987	1988	1989
		dollars			
Feeder cattle	Weak	60.00	63.00	66.00	64.00
	Moderate	62.00	64.00	67.00	64.00
	High	60.00	62.50	64.00	62.00
Market cattle	Weak	55.00	57.50	60.00	58.00
	Moderate	60.00	62.50	65.00	63.00
	High	70.00	72.50	75.00	73.00
Spread	Weak	(5.00)	(5.50)	(6.00)	(6.00)
	Moderate	(2.00)	(1.50)	(2.00)	(1.00)
	High	10.00	10.00	11.00	11.00

Table 4. Projected Financial Situations of Illinois Cattle Farms

Scenario	Initial debt-to-asset ratio 20 percent	50 percent	70 percent
		dollars	
WEAK PRICES			
Net farm income			
1986	(45,975)	(79,638)	(102,080)
1987	(49,955)	(87,826)	(113,073)
1988	(52,720)	(95,325)	(123,728)
1989	(54,439)	(102,369)	(134,322)
Net worth			
Initial	718,140	448,837	269,302
1986	657,165	354,199	152,222
1987	597,210	256,373	29,149
1988	534,490	151,048	(104,579)
1989	470,051	38,679	(248,901)
Ending debt-to-asset ratio	38 percent	95 percent	133 percent
MODERATE PRICES			
Net farm income			
1986	(25,965)	(59,628)	(82,070)
1987	(24,330)	(62,200)	(87,447)
1988	(23,597)	(66,202)	(94,605)
1989	(19,846)	(67,776)	(99,729)
Net worth			
Initial	718,140	448,837	269,302
1986	677,175	374,209	172,232
1987	642,845	302,009	74,785
1988	609,248	225,807	(29,820)
1989	579,402	148,031	(139,549)
Ending debt-to-asset ratio	24 percent	81 percent	118 percent
HIGH PRICES			
Net farm income			
1986	18,839	(14,824)	(37,266)
1987	23,698	(13,198)	(38,445)
1988	30,047	(8,837)	(37,240)
1989	34,318	(5,485)	(37,438)
Net worth			
Initial	718,140	448,837	269,302
1986	748,553	445,587	243,610
1987	783,657	450,258	223,034
1988	827,533	460,671	205,044
1989	872,648	475,908	188,328
Ending debt-to-asset ratio	8 percent	46 percent	79 percent

Simulation results presented here suggest that future commodity prices and initial debt-to-asset ratios have a strong bearing on the future survival of Illinois farms. At average levels of efficiency, dairy farms with low leverage will probably survive a scenario with moderate prices, but higher leverage or weaker prices could mean trouble for many milk producers. The projections for feeder cattle farms suggest that only highly efficient operations will survive in the future because the average farm will survive only under low leverage and high prices.

Although it is not illustrated in the above examples, the ability of farm operators to achieve above average yields and below average costs of production is also critical for their survival and prosperity. Although farmers may be able to do little about the general level of prices, they can improve their marketing skills to achieve above average prices. Clearly, efficiency is one key to surviving and prospering in production agriculture.

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FARM ECONOMICS
Facts and Opinions

DEPARTMENT OF AGRICULTURAL ECONOMICS
URBANA, ILLINOIS 61801

February, 1986

86-2/Food Security Act of 1985 & Crop Production and Marketing Plans for 1986

Although you may have already taken steps to carry out your long-run crop plans, it could be profitable to take a careful look at prices and costs and the provisions of the new farm program -- The Food Security Act of 1985 -- to see whether some changes should be made in your cropping program for 1986.

1986 Program Provisions for Feed Grains & Wheat

The recently passed Food Security Act of 1985 covers the 1986-1990 crops. The new act continues target price deficiency income supports, diversion payments for set aside acres, commodity loans and purchase agreement features of past acts. Essentially, the new act provides guidelines for gradually reducing the previous 1981 Act income and price supports for major commodities, feed grains, wheat, soybeans, rice, cotton, peanuts, sugar and dairy products -- to market clearing price levels.

TABLE 1. Program Provisions and Payment Rates, 1986

	Corn	Sorghum	Barley	Oats	Wheat
Required acreage reduction (% of base)	17.5	17.5	17.5	17.5	22.5
PIK diverted acreage (% of base)	2.5	2.5	2.5	2.5	2.5
Maximum permitted acreage (% of base)	80	80	80	80	75
Cash land diversion (% of base)	NA	NA	NA	NA	10
Target price	$3.03	$2.88	$2.60	$1.60	$4.38
Nine-month loan price	1.92	1.82	1.56	.99	2.40
Maximum deficiency payment rate	1.11	1.06	1.04	.61	1.98
Advance deficiency rate					
Cash	.31	.29	.28	.135	.55
PIK	.10	.10	.095	.045	.18
Cash diversion payment rate	..	..	..	..	$2.00
PIK diversion rate	.73	.65	.57	.36	1.10

The final provisions to be placed in effect for gaining eligibility for target price deficiency payments, diversion payments, and loans for each specific commodity in 1986 are not complete. At this time the Secretary of Agriculture has announced the following intentions which can serve as a basis for planning:

TARGET PRICES AND LOAN PRICES. For 1986 crop, the target prices will be $3.03 for corn and $4.38 for wheat, the same levels as 1985. Loan prices will be $1.92 for corn and $2.40 for wheat. Soybean loan price continues at $5.02 price level but may be reduced by 5% to $4.77 if Secretary deems it necessary. Deficiency payment rates are calculated as the difference between the target price and the first five month average price received for the commodity. This payment applies to the effective yield production on program acres planted. Producers may request 40 percent of the expected total deficiency in advance. Seventy five percent of this advance will be in cash at time of sign-up and 25 percent in generic payment in kind certificates that may be redeemed between May 1 and September 30. The value of advance payments per bushel of program production for corn are $.31 cash and $.10 PIK; for wheat $.50 cash and $.18 PIK. To encourage further reduction in the production of program crops, the 1985 Act authorizes 92% of full deficiency payments for producers who reduce acres of program crop grown from 8 to 50% of permitted acres and plant those reduced acres with a non-program or conserving crop.

DIVERSION PAYMENTS. Participants in 1986 feed grain and wheat programs will receive PIK (payment in kind) payments for diverting 2.5 percent of their feed grain and wheat bases. The PIK certificates will be generic rather than commodity specific. Producers who have price support loans on any commodity are required to make loan collateral available to satisfy the in-kind payments. The payment rate for the 2.5 percent paid diversion will be $.73 per bushel of program yield for corn and $1.10 per bushel of program yield for wheat. The payment rate for the additional paid diversion option for winter wheat producers is $2 per bushel. Producers are eligible to receive 100 percent of the diversion payments at sign up.

ACREAGE AND YIELD BASES. The Act provides for the development of acreage base for all crops grown on the farm. The acreage base for determining acreage reduction and payments for 1986 feed grain and wheat crops is the 5-year average 1981-1985 acres planted or considered planted, but not greater than 1984-1985 average. The yield base is the average of 1981-1985 effective yields for each farm with the high and low year yields dropped.

REDUCED AND DIVERTED SET ASIDE ACRE REQUIREMENTS. To be eligible for target price deficiency payments, diversion payments and commodity price support loans for wheat, you must reduce acres of wheat planted for harvest by 25 percent. The first 22.5% of the reduction is an unpaid acreage reduction. The remaining will be a payment in kind diversion payment for idling 2.5 percent of the base. An additional 10 percent of the base may be diverted and receive a land diversion payment at rate of $2 per bushel of program yields on these acres.

The feed grain program participants must reduce acreage by 20 percent. The first 17.5 percent of the reduction is an unpaid acreage reduction. There is a PIK diversion payment for diverting 2.5 percent of the base. There is no paid land diversion for corn, sorghum or other supported feed grain crops in 1986.

The eligibility requirements for land to be set aside and the cover crops to meet program requirements are likely to be the same as those for 1985 and previous programs. Winter wheat land diverted for the cash payment may be harvested for hay or silage. Grazing of conserving acres will be permitted after the March-August non-grazing period.

CROSS COMPLIANCE. Limited cross compliance is required for participation in the 1986 programs for feed grains and wheat by the strict language in the 1985 Act. Limited compliance means that to qualify for program benefits of one commodity, the producer must restrict plantings of all program crops to the base acres for those crops. Congress may amend the 1985 Act to remove the cross compliance provision requirement for participation.

PAYMENT LIMITATION. The deficiency and diversion payments will be limited to $50,000 per person. Increases in deficiency payments due to cuts in the loan rates below $2.40 for corn and $3.00 for wheat are not subject to the $50,000 limit.

SIGN UP DATES. Wheat and feed grain sign up will be March 3 through April 11.

COMPARING CROP ALTERNATIVES. As a guide to selecting crop combinations that might optimize net crop returns in your farming operation, the contributions of individual crops at varying yields and prices are presented in Table 3. An itemization of costs of producing alternate crops is presented in Table 2. The net return over variable cost indicates, in general, the effects of acreage shifts without making a complete budget of the whole cropping system. For instance, a comparison of the net return of $114 over variable costs from a 130-bushel corn crop sold at harvest for $2.00 per bushel with a net return of $145 for a 45-bushel soybean crop sold at harvest for $5.00 per bushel suggests that you shift some acres from corn to soybeans if you are not participating in the reduced acreage program for corn.

Similarly, in evaluating possible participation in 1986 program for corn, you should compare expected net returns from crop production of one acre of corn if you don't participate with net returns from the composite corn acre base of .8 acre of corn production, the deficiency payments on .175 acre reduced and .025 acre with PIK diverted payment. Similarly, compare the returns from not participating in the wheat program with the combined returns from production, deficiency, PIK diversion and land diversion.

Table 2. Estimated Costs Per Acre for Producing Crops, 1986

	Rotated corn (135 bu.)	Second-year corn (125 bu.)	Grain sorghum (120 bu.)	Soybeans (45 bu.)	Wheat (54 bu.)	Oats (80 bu.)	Double-crop soybeans (20 bu.)	Set aside cover crop	Alfalfa hay (4.5 tons)
Variable costs:									
Seed	$ 20	$ 20	$ 6	$ 9	$ 10	$ 8	$ 11	$ 4	$ 10
Pesticides	15	24	13	18	1	1	25	..	6
Fertilizer									
N	32	32	29	..	18	14	..	..	..
P, K, Lime	22	21	18	20	18	12	7	4	45
Mchy. rep. & fuel	34	34	30	28	19	17	15	7	30
Dry. fuels & rep.	16	15	18	..	..	..	..	..	..
Interest on operating capital	9	10	7	5	4	3	4	..	6
Total variable costs	$148	$156	$121	$ 80	$ 68	$ 55	$ 62	$ 15	$ 97
Other costs:									
Mchy. depr. & int.	$ 50	$ 50	$ 42	$ 40	$ 32	$ 32	$ 25	$ 22	$ 40
Labor	21	21	20	20	10	10	10	5	40
Management	15	14	12	11	8	5	5	..	14
Storing (int. & bin)	29	27	24	17	13	12	8	..	34
Misc	15	15	15	15	15	15	8	8	15
Total other costs	$130	$127	$113	$103	$ 78	$ 74	$ 56	$ 35	$143
Land costs (cash rent)	$ 90	$ 90	$ 90	$ 90	$ 90	$ 90	$	$ 90	$ 90
Total all costs	$368	$373	$324	$273	$238	$219	$118	$140	$330

Table 3. Comparison of Crop Returns per Acre, 1986

	Acres	Production or Base (bu. or ton)	Harvest Price or Rate per Unit	Crop Returns or Payment	Variable Costs	Net Returns Over Variable Costs
CORN (Not participate)	1	90	$2.00	$180.00	$120.00	$ 60.00
Participate						
Corn	.8	72	2.00	154.00	96.00	
RAP deficiency	.175	69.2	.90	62.30	3.50	
PIK diversion (80%)	.025	2.1	.73	1.50	.50	
Composite	1			216.30	100.00	116.30
CORN (Not participate)	1	130	2.00	$220.00	$146.00	$114.00
Participate						
Corn	.8	104	2.00	208.00	117.00	
RAP deficiency	.175	100	.90	90.00	3.50	
PIK diversion	.025	3.1	.73	2.30	.50	
Composite	1			$300.30	$121.00	$179.30
CORN (Not participate)	1	130	2.30	$310.50	$146.00	$164.50
Participate						
Corn	.8	104	2.30	239.20	117.00	
RAP deficiency	.175	100	.60	60.00	3.50	
PIK diversion	.025	3.1	.73	2.30	.50	
Composite	1			$301.50	$121.00	$180.50
CORN (Not participate)	1	130	2.60	$338.00	$146.00	$192.00
Participate						
Corn	.8	104	2.60	270.40	117.00	
RAP deficiency	.175	100	.30	30.00	3.50	
PIK diversion	.025	3.1	.73	2.30	.50	
Composite	1			$302.70	$121.00	$181.70
CORN (Not participate)	1	170	2.00	$340.00	$173.00	$167.00
Participate						
Corn	.8	136	2.00	272.00	138.40	
RAP deficiency	.175	130.8	.90	117.70	3.50	
PIK diversion	.025	4.1	.73	3.00	.50	
Composite	1			$379.00	$142.40	$250.30
SOYBEANS	1	30	5.00	$150.00	$ 69.00	$ 81.00
		45		225.00	80.00	145.00
		60		300.00	91.00	209.00
WHEAT (Not participate)	1	54	2.40	$129.60	$ 30.00	$ 99.60
Participate						
Wheat	.65	35.1	2.40	84.25	19.50	
RAP deficiency	.225	33.8	1.80	60.75	4.50	
PIK diversion	.025	1.3	1.10	1.43	.50	
Land diversion	.10	5.2	2.00	10.40	1.00	
Composite	1			$156.83	$ 25.50	$131.33
DOUBLE CROP SOYBEANS	1	20	5.00	$100.00	$ 62.00	$ 38.00
WHEAT & DC SOYBEANS						
Not participate	1			$229.60	$ 92.00	$137.60
Participate						
Composite	1			$221.83	$ 65.80	$156.03
OATS	1	60	$1.00	$ 60.00	$ 52.00	$ 8.00
		80	1.00	80.00	55.00	25.00
		100	1.00	100.00	60.00	40.00
HAY	1	3.0	$60	$180.00	$ 72.00	$108.00
		4.5	60	270.00	97.00	173.00
		6.0	60	360.00	127.00	233.00

[1] Includes seed, pesticides, fertilizer, machinery repairs and fuel, drying costs, and interest on operating capital only.

The effect of participation in the 1986 feed grain and wheat programs on farm returns depends upon several factors. Three major factors are: 1) expected market prices, 2) expected yields relative to program yields, and 3) the extent to which expenditures can be reduced by idling acres. Other factors are the level of payments for idled acres, the opportunity returns from land set aside for reduced and diverted acre program requirements, and the value of advance payments in meeting cash flow needs. And in case of wheat, another factor is the effect of participation on double crop returns.

The effect of varying levels of prices on net returns for 130 bushel corn is shown in Table 3. For the comparisons of participation vs. nonparticipation in the feed grain and wheat programs, it is assumed that the expected yield is 4.0% greater than the effective program yield used for computing deficiency and diversion payments. The market prices for determining deficiency rates are assumed to be approximately 15 cents greater than harvest time prices.

At low price levels, net returns from participation exceed those from nonparticipation. As prices received increase, the net returns for participation remain unchanged because increases in value of production are offset by lower deficiency payments. As market prices approach the target price levels, returns for nonparticipants exceed participants because they have larger quantities of grain to sell at higher prices.

At harvest delivery prices currently being offered to producers of $2 for corn and $5 for soybeans, a composite corn base acre under participation in feed grain program returns more than the return from an acre of soybeans. The possibility of double cropping wheat land with soybeans reduces the advantage of partipating in the wheat program. However, the cross compliance requirements between program crops grown on the farm requires that producers compare the combined net returns for participation on both corn and wheat crops.

Livestock producers considering participating in the program should compare quantity of feed grains that could be raised on the idled acres required for participation with the amount of feed grains that could be purchased with with sum of the expected deficiency and diversion payments plus the crop costs saved by the idle acres.

Producers should carefully budget alternatives to their situation using worksheet AE-4543 Income Possibilities: Participation vs. Non-Participation in 1986 Government Program for Corn or Wheat. Copies of this worksheet are available in county Extension Offices.

R. A. Hinton

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INCOME POSSIBILITIES WORKSHEET

Participation vs. Non Participation in 1986 Government Program for CORN

	PARTICIPATE Example	PARTICIPATE My Farm	NOT PARTICIPATE Example	NOT PARTICIPATE My Farm
PROGRAM INFORMATION				
1. Corn acreage base	100 A.			
2. Permitted corn acreage (line 1 x .8)	80 A.		100 A.	
3. RAP set aside acres (line 1 x .175)	17.5 A.			XXXXX
4. PIK diversion acres (line 1 x .025)	2.5 A.			
5. Program yield	125 bu.			
6. Program production (line 2 x line 5)	10,000 bu.			XXXXX
7. Expected yield	130 bu.		125 bu.	
8. Expected production (line 2 x line 7)	10,400 bu.		12,500 bu.	
EXPECTED GROSS INCOME				
9. Expected grain return				
a. harvest sales			2,100 bu. x $1.90 = $3,990	
b. loans	10,400 bu. X $1.92 = $19,968			
c. stored sales or gain on loan	10,400 bu. x $.25 = $2,600		10,400 bu. x $2.17 = $22,568	
10. PIK diversion (line 4 x line 5 x $.73)	228			XXXXX
11. Deficiency payment (line 6 x $3.03 - 5 mo. price $2.13 or max. $1.11)	9,000			XXXXX
12. Int. on harvest grain sales or loan (line 9a or 9b x 12% x 9/12)	1,797		359	
13. Interest on advance deficiency (line 6 x $.41 + line 10 x 12%)	519			XXXXX
14. TOTAL GROSS INCOME EQUIVALENT AT LOAN MATURITY (SUM LINES 9-13)	$34,112		$26,917	
EXPECTED CASH EXPENSES				
PROGRAM CROP				
15. Fertilizer (line 2 x $58/A.)	$ 4,640		$ 5,800	
16. Seed, pest, etc. (line 2 x $45/A.)	3,600		4,500	
17. Machinery fuel & repairs ($34/A. x line 2)	2,720		3,400	
18. Drying and storage (line 8 x $.22/bu.)	2,288		2,750	
COVER CROP				
19. Seed and crop (line 3 + line 4 x $8/A.)	160			XXXXX
20. Machinery fuel & repairs (line 3 + line 4 x $12/A.)	240			XXXXX
OTHER CASH EXPENSES AND WITHDRAWALS				
21. Interest on crop expenses (sum lines 15-20 x 12% x 6/12)	819		987	
22. Interest on redeemed loan (line 9b x 8% x 9/12)	1,198			XXXXX
23. _____				
24. TOTAL CASH EXPENSES (sum lines 15-23)	$15,665		$17,437	
INCOME ABOVE EXPENSES (LINE 14 MINUS LINE 24)	$18,448		$ 9,480	
NET ADVANTAGE FOR PARTICIPATION (Column 1 minus Column 2)	$ 8,968			

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FARM ECONOMICS
Facts and Opinions

DEPARTMENT OF AGRICULTURAL ECONOMICS
URBANA, ILLINOIS 61801

March 1986

86/3 WHAT CAN BE DONE WITH LAND CONTRACTS?

From our survey and from a review of land transfers in Illinois, we have found that 25 to 35 percent of all bona fide farmland sales are financed on a contract between the seller and the buyer. In the balance of the sales a commercial lender provides part of the financing with funds secured by a mortgage on the property and mortgage note. The latter transactions are described as cash or "cash to mortgage" sales.

Most contracts for sale require a smaller down payment than is required by commercial lenders. The contract down payment probably ranges from 10 to 30 percent. The seller has the incentive to accept less than 30 percent down in order to spread capital gains over the period of payment; otherwise the full capital gain would be due the year of the sale. The incentive for the purchaser is the lower cash down payment and, often, a lower interest rate. In contract sales, payments on the principal frequently have been small--as if amortized over 25 years or more--but the balance for the full principal is due in a much shorter period of time, typically in 5 to 10 years. The final payment is referred to as a "balloon" payment because it is much larger than the preceding payments. Some buyers accept the shorter term on a contract because at the time of the sale they believe that when the balloon payment is due they will have paid enough of the principal to get a commercial mortgage. Other buyers expect the value of the land to inflate. When values inflate rapidly, the balance due on the contract may become a small enough proportion of the new value of the property so that a commercial loan can be obtained to pay the balance of the contract.

Unfortunately, it has not worked out this way for many buyers. Having bought land on contract in the late 1970s or early 1980s, they now find that the balance due is more than the land is worth in today's market. Some buyers cannot pay the 5- or 10-year contracts coming due or already due. Other contract buyers are finding it difficult or impossible to continue meeting the scheduled payments.

In most cases sellers do not want the land back or they would not have sold it in the first place. Buyers do not want to lose the land because it has already cost them a significant amount of money--their initial down payment and subsequent payments over the years. Furthermore, they have probably integrated the land into their farming operations and perhaps even expanded their farm machinery or labor force to handle the extra acreage. Therefore, both the sellers and the buyers are motivated to sit down across the kitchen table and work out arrangements to adjust the contract.

The seller might have been better off to have sold for cash and reinvested the money (assuming the investment was a good one), but that past decision cannot be changed. Probably the lowest contract payment that a seller will now accept equals the amount he could get in net rent if the land were returned. So the range for renegotiating payments is from the rent level to the contract level.

Sellers do not like to forgive part of the payment or lower payments unless they get some compensation in return. This compensation may include increasing the length of the contract or adding some of the current forgiveness to the end of the contract. Some contract purchasers have been able to reach an agreement with sellers in which the contract is lengthened and the current payments are renegotiated to a more manageable level. Some cases have tied future changes in payment to the land price index or to the index of prices received by farmers. In those cases, buyers can continue to handle their payments but sellers will share in gains if and when land prices or commodity prices go up. Another method has been to reduce payments to a realistic level, lengthen the contract, and add the amount from the reduced payments to the remaining principal. Yet another method is simply to lengthen the contract until the land is paid off.

Generally each contract is different: the personalities, financial positions, and needs of buyers and sellers are different, as are the degrees of communication between them. Each case, therefore, must be negotiated on an individual basis. Negotiating a new contract agreement takes time and requires an understanding of the positions of both parties. It may be helpful to consult a financial expert who understands and can calculate the present value of cash flows and future sums. Buyers and sellers should also check the tax consequences of any proposed changes, probably with a tax accountant. Negotiating a change in a land contract does not always work, but it is worth a try. Do not wait to negotitate, however, until the contract is in default.

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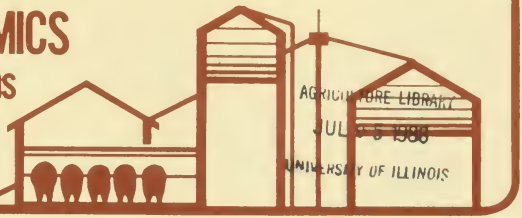

March 1986

86-4/Farms and Rural Communities

The current farm financial crisis has focused attention once again on the impact agricultural trends have on rural institutions, small communities, and of course, on farm families themselves. In many respects this is a replay of a familiar theme in American agricultural history: the survival of fewer and larger farms with an exodus of farmers and their families, consolidation or disappearance of many rural institutions, decline in economic activity, and the "death" or decline of many rural communities. The major differences between now and what happened earlier this century are that the affected farming base is not nearly as large as it was and that rural communities are not as symbiotically tied to agriculture as they once were. Rural communities have been able to adapt and diversify over the years, and agriculture is no longer the keystone of the rural economy. As a result, it is much more difficult to predict the effect of the current farm crisis on the rural community as a whole. Much will depend on how closely the nonfarm economy is linked to agricultural production and income. This report examines the relationship between agriculture and rural communities, and some of the ways changes in agriculture have affected rural Illinois.

RURAL COMMUNITIES IN HISTORY

Small, rural communities are liberally scattered across the midwestern landscape. As a region, the Midwest leads the nation with about 6,000 of these communities. Illinois, which has close to 900, ranks near the top of the nation in the number of such communities. The circumstances surrounding their origins involve a wide range of motivational, historical, and accidental causes. Many small communities sprang up from a grass-roots desire to keep government small and more responsive to the public, and to maintain a feeling of community among their residents. The formation of a new community was one way of ensuring "smallness." Many other rural communities were the result of numerous speculative ventures, a population expansion, or the location of transportation routes.

Whatever their origins, a common thread unified rural communities: their intimate relationship with agriculture. Rural communities arose mainly to serve the hundreds of thousands of farmers and their families across the state. When agriculture was made up of numerous small family farms, and transportation was difficult, it was inevitable that the life of a community would be closely meshed with its ability to meet the needs of farm families. Today if they still exist, rural

communities that are tied solely to agriculture are quickly becoming extinct. Many farms have disappeared, and the functions of small communities have changed as a result of increased mobility, better transportation, and employment in off-farm jobs.

The plight of many small communities is well known. Technological change in agriculture, the introduction of automobiles, and the development somewhat later of a well-developed road system rendered obsolete many of the functions rural communities typically performed while the growth of cities exerted a "pull" on the residents of rural areas. For the better part of the past five decades there has been a steady stream of migrants from farms and small towns who have gone to work or to school in the bigger cities of the state and region. For a large part of the history of Illinois, rural communities have not fared well. For many, decline has been the order of the day.

It is not true, however, that all rural communities have declined, or been "left behind." Some have grown because they have had access to transportation; others because they were located near a city or larger town, or in an attractive, scenic area of the state. In fact, over the years many rural communities have grown so quickly that they have become small cities and larger urban towns. Countless other rural communities have held their own because of state and local efforts to bring in new employment and to improve the types of services and facilities people have come to expect as part of everyday life. Remarkably, these rural changes occurred when off-farm migration was high, when some farms were disappearing, and other farms were growing in size.

The lists below show some of the major forces affecting rural communities. On the left are some of the "negative" forces that have weakened rural communities; the right side shows some of the more "positive" forces that have contributed to their growth and stability. Not meant to be exhaustive, these lists show that multiple influences, both "plus" and "minus," have been shaping rural communities in Illinois and elsewhere.

(-)	Rural Communities	(+)
• Technological change in agriculture		• Rural industrialization
• The "pull" of cities on rural people, especially youth		• Improvements in the quality-of-life in rural areas
• Changes in rural consumer preferences		• Increased importance attached to recreation and leisure
• Improvements in transportation		• Changed perceptions of urbanites about rural living
• Emphasis on higher education among rural youth		• Creation and decentralization of institutions of higher education

RURAL FARM AND NONFARM POPULATION TRENDS

The trend in agriculture toward fewer, larger farms has been extensively documented. This trend has resulted in a dramatic decline in the number of people living and working on farms. Figure 1 shows what has happened since 1940, when the farm and rural nonfarm populations were nearly equal in size. Exactly a third of the number of people living on farms in 1940 did so in 1980. If data for the last few years were available, they would show even further losses in farm population, although these losses would not be as dramatic as those in the 1940s and 1950s.

While the farm population was steadily declining, the trend of the nonfarm rural population was in the opposite direction. This segment of the rural population lived in the open country, in small roadside settlements, rural communities, or unincorporated areas near a larger town or city. From 1940 to 1980 the gap has been growing between the number of farm and nonfarm people in rural areas, with the result that farm people are now a relatively small minority, even within the rural areas of Illinois. Of course, many of the rural nonfarm people have their roots in agriculture because many farmers who quit farming and their families moved into small communities or continued to live in the countryside. More recently, rural areas have experienced a net in-migration of people from urban areas: between 1970 and 1980 the number of rural people actually increased after three consecutive decades or more of decline. The effect of this trend will be to make rural Illinois even more diverse over the years.

It is apparent that the loss of farms and farm people in the rural areas of Illinois has not led to much overall loss in rural population. In fact one might argue that, demographically, rural Illinois is holding its own over the past several decades, despite the enormous losses in farms and farm people. Table 1 shows this stability in the rural nonfarm population. The rural population is presently what it was in 1940, 14 percent of the state's population with little variation from decade to decade.

Table 1. Residential Distribution of Illinois's Population, 1940 to 1980

Residence of population, percent	Year				
	1940	1950	1960	1970	1980
Urban	74	78	81	83	83
Farm	12	9	6	4	3
Nonfarm	14	13	14	13	14

AGRICULTURAL IMPACT ON RURAL AREAS

To argue that farm trends have not affected rural areas, or urban areas for that matter, is to ignore the central fact that the loss of farms involves a lot more than simply reducing the number of people in the countryside. It involves a redistribution of people from farms in the countryside to cities and more densely populated rural communities--an absolute loss of people in agriculture-dependent rural areas. The loss of these farms also entails the consolidation of schools, the loss of businesses serving farmers, the closing of churches, and an "aging" of the rural population as younger people leave.

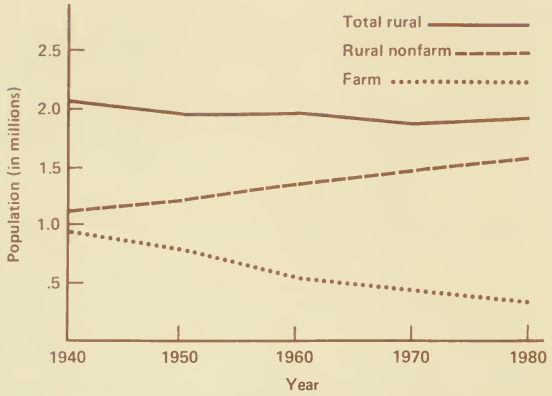

Figure 1. Trends in the composition of rural populations, 1940 to 1980.

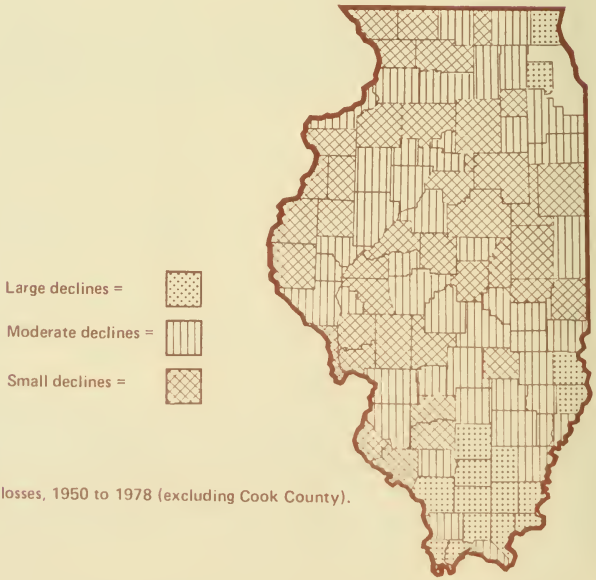

Figure 2. Farm losses, 1950 to 1978 (excluding Cook County).

The lack of data recording many of these effects makes them no less real. The evidence is all around in the form of closed buildings and businesses, deserted main streets, and abandoned farms, as well as in the statistics, which reveal that there are more elderly people and higher levels of poverty in rural areas. In some rural areas of Illinois one in every four or five persons is over 65 years of age; in some areas a third of all the people live below the poverty level. Many of these developments can be traced directly or indirectly to changes in agriculture over the past several decades.

Farm losses have influenced the growth and economic life of rural communities. Unquestionably, over the past several decades many rural communities have lost population, and in all except a few counties, there have been large-scale losses in the number of retail establishments. Both of these trends have been paralleled by a dramatic reduction in farms in all areas of the state (Figure 2). For example, between 1950 and 1978 there has been an overall 46 percent reduction in farms. Likewise, there has been an overall 12 percent decrease in retail establishments statewide (excluding Cook county).

These trends are not in question. What is in question is how closely they are related to trends in agriculture. Is the loss in farms closely linked to either population loss in rural communities or declines in retail establishments? The answer to both questions is that over the thirty years or so covered in our data there is but a minimal relationship between farm losses at the county level and either rural community decline or loss of retail establishments. This can be seen in Table 2 where counties are categorized by the magnitude of their farm losses (between 1950 and 1978) and examined against changes in retail establishments and the proportion of rural communities losing population during the last three decades. Counties with "large declines" in farms had a high percentage of rural communities losing population between 1950 and 1960, but since then, these counties have not had substantially different, adverse effects on the decline of rural communities. These as well as other data suggest that the magnitude of farm losses does not have the effect on the loss of population in rural communities that many assume.

Table 2. Illinois County Farm Losses, Rural Community Decline and Retail Loss

County level farm losses, 1950-1978[a]	Percent change in retail establishments, 1948-1977	Percent of rural communities losing population		
		1950-1960	1960-1970	1970-1980
Large declines (N=16)[b]	-21	70	38	22
Moderate declines (N=46)	-13	36	29	24
Small declines (N=39)	-15	34	28	26

[a] Excludes Cook county.

[b] Large declines are greater than 2 percent per year; moderate declines range from 1.5 to 2 percent per year; and small declines are less than 1.5 percent per year.

A similar finding comes from our examination of farm losses in relation to changes in retail establishments in Illinois counties (excluding Cook county). Counties that had large average annual farm losses also had higher losses in retail establishments. Again, however, the relationship is not very strong, thus forcing the conclusion that the magnitude of farm losses over time is not closely linked to changes in the number of retail establishments. What appears to be related to gains in retail establishments is either the presence of a large urban center or the presence of a state university in the county. Fifteen of the sixteen counties experiencing increases in retail establishments fit one or the other of these categories.

Forces other than agriculture have come to play an important part in rural areas. A recent study of rural communities has shown, for example, that contrary to popular perceptions, few, if any, rural communities have actually "died out." In fact, there are more rural communities today than thirty years ago, and many others have grown so fast that they are no longer defined as "rural" by the Census Bureau. That study also pointed out the influences on rural communities of the expansion of transportation--especially the interstate system--the growth of larger towns in rural areas, and the growth of nearby cities. Rural communities located near good highways, near larger urban centers, and within easy commuting distance of cities have fared well over the years.

Agriculture has had an impact on rural communities, their business life, and their growth, but this impact has been reduced over time because relatively few jobs are agriculturally related. Of all the leading agricultural states, fewer jobs are related to agriculture in Illinois than in any other midwestern state. With 22 percent, Illinois ranks next to last in the number of jobs related to agriculture, surpassing only California, which has 18 percent. Nonfarm jobs greatly outnumber farm jobs, and even farmers are dependent on the money they make when they are off the farm. It is one of the small ironies of history that the survival of many farms has been due to the adaptation and diversification of rural economies in the face of massive, historic agricultural changes.

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FARM ECONOMICS
Facts and Opinions

DEPARTMENT OF AGRICULTURAL ECONOMICS
URBANA, ILLINOIS 61801

April 1986

86-5/GENERAL ECONOMIC FACTORS THAT AFFECT AGRICULTURE

Some of the dark clouds that have been hanging over agriculture are rolling back as many very positive elements in the general economy begin to affect it.

INTEREST RATES

Recently we have had one of the sharpest declines in interest rates that we can recall. Government long-term bonds--those that require more than five years to mature--produced an average yield of 13.7 percent in July of 1984; last week the best available government bond yields were under 8.0 percent: this represents a decline of over 40 percent. Other countries are lowering interest rates. Some analysts believe that long-term government bond rates could go as low as 7 percent. There has been a lag in the decline of mortgage rates, but now they are also dropping, with some already in single digits for the first time since 1979. A decline in mortgage rates should signal a comparable increase in capital values if income to the same physical unit of capital--an acre of land, for instance--remains the same. This decline in interest rates will reduce the cost of farm operations and of carrying land for those with farm mortgages.

ENERGY COSTS

Oil prices have dropped drastically; these prices should soon be transmitted to the pumps. Bulk fuel in New York is now down to 41 cents per gallon on gasoline. Direct suppliers to large-capacity consumers are quoting diesel fuel from 55 to 65 cents per gallon. Recent fuel costs per acre on grain farms in 1984 and 1985 were $12 or more, but these costs should drop to around $7 per acre or less. This development would also help farmers cut operating costs. The decline in the cost of fuel should have other positive effects; for example, nitrogen, herbicides, and insecticides should come down in price because oil and gas are the feed stock for the nitrogen and chemical industries. Returns should benefit from the lower cost of energy as it works its way through the economy. Because the cost of transportation is a major expense both on the input and product side of agriculture, this cost should come down as well.

THE RATE OF INFLATION

During an inflationary cycle, farmers are often better off at the beginning of the cycle, but as inflation continues, production costs rise and frequently leave farmers worse off than before. In a more stable economy, the techniques involved in managing a business can be applied better. The rate of inflation has now been

below 4 percent for four years--from 1982 through 1985. Some economists are now forecasting a rate below 3 percent in 1986, due in large part to the drop in the cost of energy. This drop will benefit the cost side of farm operations. But if inflation no longer becomes a factor in the psychology of the market, the markets for machinery, land, and commercial property will be negatively affected because the hope of further increases in prices will be dashed.

THE GENERAL LEVEL OF EMPLOYMENT

The number of people employed in the United States has never been higher, and the rate of participation of the labor force (the percentage of people over sixteen years old who are fully employed) is over 64 percent, the highest rate ever. The number of chronically unemployed (those out of work more than six months) has declined since the fall of 1985 by 17 percent. For farmers with low incomes and a resource base that is not large enough to generate higher income, it may be the best time to seek alternative employment. Most farmers have many marketable skills and a general reputation for good work habits and honesty. Age may work against some. Relocation may be necessary. But even though psychologists have found that changing jobs ranks high along with marital problems and the loss of close relatives as a source of trauma, a change of jobs sometimes can make everyone better off. A high level of employment also improves the demand for livestock and other agricultural products.

THE VALUE OF THE DOLLAR AND THE BALANCE OF TRADE

The current national agricultural policy is predicated partly on the expansion of grain exports as the value of the dollar declines. The rise of the dollar certainly worked against the United States in the early 1980s, but the opposite does not necessarily follow. The value of the dollar has declined about 25 percent over the past year against most European currencies. It is true that many of these countries are grain importers, especially of soybeans or soybean products, and a lower-valued dollar does reduce our prices in their currency; but the currencies of some of our competitors--the grain-producing countries of Brazil and Argentina, for instance--are declining against the dollar. This decline makes prices in their currency higher for their grain exports. We know how difficult it is for us to reduce production when prices decline. Is it safe, therefore, to assume that other producers will reduce the supply that they put on the market when their prices decline? The best scenario we should expect for exports is that lower prices may increase the total demand over time and that we may be able to hold our share of that increasing demand.

THE BUDGET DEFICIT

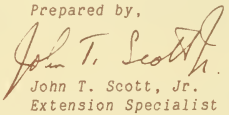
Many people are worried about the budget deficit. Reagonomics is a new name for the Keynesian economic policy practiced by Roosevelt and others. A budget deficit during a period of unemployment pushes the economy toward full employment without inflation. This is the economic situation that we are experiencing. When we approach full employment--as we are now--deficits raise prices and interest rates, so the deficit now needs to be reduced. A government surplus without full employment would cause recessionary conditions, and a rapid change in government spending, regardless of the level of employment, would probably cause substantial economic changes. The deficit, therefore, should be reduced gradually.

A BLACK CLOUD REMAINS

Agricultural surpluses have been the rule rather than the exception since the beginning of this nation. Demand has outpaced supply only a few times: the Civil War, World War I, World War II, and in the 1970s, when the dollar was devalued against gold from $35 per ounce to $105 and then allowed to float as gold went to about $150 an ounce within a year. We now seem to be back to the normal situation: contending with agricultural surpluses. It could be a long time before demand outpaces supply at prices that will produce a profit for all the resources now allocated to agricultural production.

Currently, many forces in the U.S. and world economy are very beneficial to agriculture: lower interest rates, a low rate of inflation, lower energy costs, a record high level of employment, a deficit that will probably be reduced to some extent, and the lower value of the dollar, which will not be a quick fix but over a period of time should help exports. On the dark side, however, are agricultural surpluses, which will probably put downward pressure on commodity prices. With continual genetic improvements of crops and livestock, other improved technology, and better management of farms, the American farmer will be able to produce an ample supply of food for a long time to come. In the final analysis, is it not better to be able to produce too much food than too little so that resources can be allocated to benefit society in other ways?

Prepared by,



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FARM ECONOMICS
Facts and Opinions

DEPARTMENT OF AGRICULTURAL ECONOMICS
URBANA, ILLINOIS 61801

April, 1986

86-6/COST OF GROWING CORN AND SOYBEANS, 1985

In 1985, the total cost per acre for growing corn in Illinois averaged $377 in the northern section, $378 in the central section with the higher soil ratings, $348 in the central section with the lower soil ratings, and $290 in the southern section. The soybean costs per acre were $292, $296, $266, and $244, respectively. The total crop costs per acre were lower in southern Illinois because that region has the lowest land cost in the state (see the accompanying table). The total costs per bushel ranged from $2.21 to $2.52 for corn and from $5.22 to $6.21 for soybeans. Cost per bushel decreased for corn and soybeans since 1984 because of the extraordinary high yields obtained in most regions of the state. Variations in total costs were related to weather factors, yields, and the quality of the land.

The above figures were obtained from Illinois Farm Business Records that are kept by farmers enrolled in the Illinois Farm Business Farm Management Association. The samples included only farms of more than 260 acres on the more productive and nearly level soils in each area of the state; these farms are without livestock. Farm located in 22 counties north and northwest of the Illinois River are included in the sample for northern Illinois. Farms from 36 counties below a line from about Mattoon to Alton are in the sample for southern Illinois. The remaining 44 counties make up the sample for central Illinois. The sample farms averaged 635 tillable acres in northern Illinois, 631 acres in the central section with high soil ratings, 673 acres in the central section with lower soil ratings, and 858 acres in southern Illinois.

This summary includes some factors that farmers consider as costs of doing business, but which some other sole-proprietor businesses may not. These factors are not used as expense items on income tax returns. Examples include the charge for labor on work done by the farm operator, a rental charge for use of all the land (both owned and rented), and an interest charge on equity in the inventories.

NONLAND COSTS

For soybeans, soil-fertility costs were allocated on the basis of phosphorus, potassium, and lime removals, with the residual cost allocated to corn. The seed, crop, chemical, and drying expenses also included some commercial drying and storage and the estimated value of home-raised seed. The costs of fuel, machine hire, and repairing machinery were reduced for income received from custom work. The labor costs included the cash value of hired labor, plus a charge for available unpaid labor at a rate of $1,150 per month. The building and storage costs used

were for repairs and depreciation only. The nonland interest charge in 1985 was 11 percent on the average of half the inventory value of crops at the beginning and at the end of the year, plus the depreciated value of machinery and buildings, plus half the total operating expenses. Overhead costs included insurance, utilities, the farm share of automobile expenses, and miscellaneous items. No charge has been made in this analysis for management. This charge might normally be about 5 percent of the total cost per bushel, or 15 cents for corn and 30 to 35 cents per bushel for soybeans.

LAND COSTS

These costs included the adjusted net rent and the real estate taxes. Net rent was represented as the average received by crop-share landlords as reported on recordkeeping farms for the four-year period from 1981 to 1985. Caution is needed in interpreting differences in land costs between areas. In the long run, the changes in the net rent residual return to landowners should tend to equalize the total costs of production between areas.

COST PER BUSHEL

Cost per bushel declined in 1985 from 1984 for both corn and soybeans mainly because of record high yields for both corn and soybeans. Corn yields averaged 13 to 31 bushels per acre higher than the 1982-1985 average; soybean yields averaged 5 to 10 bushels per acre higher. Total costs per acre dropped 1 to 5 percent for corn and 3 to 7 percent for soybeans.

Current corn and soybean selling prices continue to stay below the average total cost of production, using 1985 total costs and average yields for the period from 1982 to 1985. For an owner-operator with these yields, it would take from $1.04 to $1.28 a bushel for corn, and from $1.82 to $2.33 a bushel for soybeans to cover the variable costs listed in the table. But to recover total costs, it would take from $2.68 to $2.86 a bushel for corn and from $6.33 to $6.95 a bushel for soybeans.

In 1985 record yields in many areas of the state brought the total cost of production closer to the market price, especially for corn. Looking ahead, we see that current market prices are considerably lower than the total cost of production, based on average yields for the period from 1982 to 1985. There continues to be pressure to adjust production costs. These adjustments come primarily through land values because land is a residual claimant of returns over the most relevant costs. The future could continue to bring pressure for lower land values and lower cash rents.

To compute the break-even cost per bushel for growing corn and soybeans, individual tenants and landowners need to divide the costs and yields shown in the table as they are shared by the terms of the lease. As land values drop, the charge for the use of land tends to drop until total costs to produce corn are in line with expected price levels.

Dale H. Lattz *D.H. Lattz, Extension Specialist Farm Management*

ots Per Acre for Growing Corn and Soybeans in 1985 on Illinois Grain Farms with No Livestock

	Corn				Soybeans			
	North	Central[a]	Central[b]	South	North	Central[a]	Central[b]	South
uber of farms.....	300	512	227	233	300	512	227	233
es in crop.....	370	307	334	329	210	283	287	382
OLAND COSTS								
iable costs:								
Sil fertility.....	$ 56	$ 55	$ 54	$ 52	$ 17	$ 19	$ 18	$ 17
Psticides.....	21	19	19	20	18	18	18	19
Sed.....	22	22	21	18	12	12	12	12
ying and storage.....	16	21	17	8	6	5	4	2
Rpairs, fuel, and hire..	30	29	29	33	24	26	25	27
otal, variable costs...	$ 145	$ 146	$ 140	$ 131	$ 77	$ 80	$ 77	$ 77
ercent change from 1984	-1	5	3	3	-4	0	-3	-1
ter nonland costs:								
Lbor.....	$ 28	$ 30	$ 30	$ 27	$ 27	$ 28	$ 27	$ 26
Bildings and storage....	16	9	10	10	10	5	5	5
Achinery depreciation...	35	32	29	31	28	26	24	26
Nnland interest.....	36	34	31	21	33	30	26	20
Erhead.....	12	11	12	8	12	11	11	8
otal, other costs.....	$ 127	$ 116	$ 112	$ 97	$ 110	$ 100	$ 93	$ 85
otal, nonland costs....	$ 272	$ 262	$ 252	$ 228	$ 187	$ 180	$ 170	$ 162
ercent change from 1984	-4	0	-2	-5	-6	-2	-6	-7
AD COSTS								
es.....	$ 20	$ 22	$ 18	$ 10	$ 20	$ 22	$ 18	$ 10
ually adjusted net rent	85	94	78	52	85	94	78	52
otal land cost.....	$ 105	$ 116	$ 96	$ 62	$ 105	$ 116	$ 96	$ 62
AL ALL COSTS.....	$ 377	$ 378	$ 348	$ 290	$ 292	$ 296	$ 266	$ 224
cent change from 1984..	-4	-1	-3	-5	-5	-3	-5	-7
5 yields, bushels per re.....	150	171	156	115	47	54	51	38
dland cost per bushel...	$1.81	$1.53	$1.62	$1.98	$3.98	$3.33	$3.33	$4.26
tal, all costs per shel.....	$2.51	$2.21	$2.23	$2.52	$6.21	$5.48	$5.22	$5.89
rage yields for the riod 1982-1985.....	132	141	125	102	42	44	42	33
land cost per bushel...	$2.06	$1.86	$2.02	$2.24	$4.45	$4.09	$4.05	$4.91
tal, all costs per shel.....	$2.86	$2.68	$2.78	$2.84	$6.95	$6.73	$6.33	$6.79

E: Below "dash" line, the entries shown are costs based on average yields for the period from 1982 1985.

il productivity ratings of 86 to 100.

il productivity ratings of 56 to 85.

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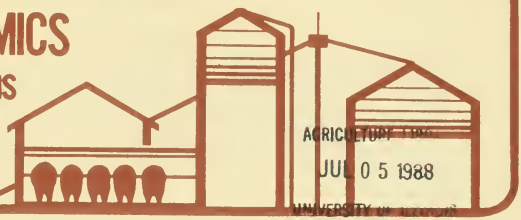

86-7/The Financial Position of Illinois Farm Operators: Cost and Returns From Crop and Livestock Enterprises

May 1986

BETTER NET INCOMES SLOW DECLINES IN NET WORTH

Data on net farm income from the Illinois Farm Business Farm Management Association (FBFM) can be used to estimate changes in net worth. On a cost basis, without considering inflation or deflation of capital asset values, the change is calculated by adding net farm and net nonfarm income as shown in Table 1 and then subtracting withdrawals for family living and for income and Social Security taxes. Using this procedure, the net worth of the average Illinois farm operator increased by $1,240 in 1982, declined by $4,174 in 1983, dropped another $10,551 in 1984, and increased by $4,037 in 1985.

The total decline in net worth on a balance sheet based on fair market value would be much greater if it included the change in land values during the period from 1982 to 1985. Net worth changes would vary greatly among farms and areas in the state. This report is based on a summary of 3,980 Illinois Farm Business records, which are kept in cooperation with the Illinois FBFM Association and the University of Illinois Cooperative Extension Service.

Net farm income is the accrued value of the operator's share of farm production less total operating expenses, including the amount of interest paid and depreciation plus gain or loss on machinery or buildings sold. When added to net nonfarm income, this is the income available for family living expenses, income and Social Security taxes, long-term debt principal, and savings. Estimates used in Table 1 for net nonfarm income and withdrawals for living expenses and taxes were based on a sample of 246 central Illinois farm families. The estimates balanced all sources of farm and nonfarm funds with the uses of funds to identify precise expenditures for these withdrawals. These expenditures were then adjusted downward by 10 percent to reflect belt tightening that already occurred as an adjustment to lower incomes and for larger than average farms in central Illinois.

CAPACITY FOR REPAYMENT OF CAPITAL DEBT

The average funds available for repayment of capital debt per farm family for all 3,980 farm operators were estimated at $24,632 in 1982, $20,152 in 1983, $13,851 in 1984, and $27,840 in 1985 (see Table 1). These were the funds estimated to be available for capital purchases and principal payments on long-term debt. The table shows actual dollar commitments per farm that were made for capital purchases of machinery, equipment, or buildings. Note that in 1982 and 1983, these commitments would have almost depleted all of these funds and that in 1983 these commitments were greater than funds available for capital debt repayment. For the

period from 1982 to 1985, capital purchases were lowest, and funds available for repayment of capital debt were highest in 1985. As a result, the most funds during this four-year period were available in 1985 for repayment of long-term debt. Although in three of the last four years, commitments to capital purchases would have depleted all of the funds available for repayment of long-term debt, the average farm with long-term debt repayments would probably borrow funds to finance the new capital purchases as long as there was adequate collateral in the business.

The records show funds available for repayment of debts have varied greatly among areas in the state. Estimated changes in net worth in 1985 showed positively for central Illinois and negatively for southern and northern Illinois. All areas of the state except the tip of southern Illinois showed positive changes in net worth as compared to 1984.

INTEREST PAID AS A PERCENT OF GROSS

In 1984, 73 percent of the FBFM farm operators had positive net farm incomes with cash interest payments less than 20 percent of the gross farm returns. The 27 percent with interest payments exceeding 20 percent of the gross had negative net farm incomes and could be expected to have problems with cash flow. The 8 percent paying more than 35 percent of the gross for interest had negative net farm incomes averaging $40,520 per farm. This group could be expected to have difficulty maintaining a farm business without off-farm income. The percentage of farms having negative farm incomes in 1985 should be less than in 1984. Net farm incomes were higher in 1985 than in 1984 because of record yields in many areas of the state. Highest net farm incomes were reported in the central part of the state.

Table 1. Estimated Change in Net Worth and Capacity for Repayment of Capital Debt for 3,980 Illinois Farm Operators

	All Illinois counties			
	1982	1983	1984	1985
Net farm income	$19,540	$16,627	$ 8,624	$22,037
+ Net nonfarm income[a]	8,202	6,873	9,208	7,500
- Family living expenses[b]	22,180	23,845	24,042	22,000
- Income and Social Security taxes[b]	4,322	3,829	4,341	3,500
Change in net worth	$ 1,240	$-4,174	$-10,551	$ 4,037
+ Depreciation	23,392	24,326	24,402	23,803
Funds available for capital debt repayment	$24,632	$20,152	$ 13,851	$27,840
Capital purchases	$22,835	$19,325	$ 15,741	$13,875
Cash interest paid	$20,392	$19,127	$ 18,491	$18,863

[a] Actual amounts identified from a central Illinois sample of 246 farms for 1982, 1983, 1984; amounts for 1985 are estimated.
[b] Actual amounts identified from a central Illinois sample of 246 farms for 1982, 1983, and 1984 reduced by 10 percent; amounts for 1985 are estimated.

COST AND RETURNS FROM CROPS

Corn and soybeans are crops that make important contributions to net farm incomes and the current financial status of farm operators. See Figures 1 and 2 for the cost and return per bushel of both corn and soybeans produced each year from 1975 to 1985 on 500 central Illinois grain farms with high-quality soils and no livestock. In Figure 1, note that the total cost line for growing a bushel of corn exceeded the average annual Illinois corn price line in five of the nine years since 1977. The difference between the total of all cost and the total nonland cost line is the charge for the use of land. The deficits indicate that profits (returns for risk and management) had to come from equities in capital, primarily land, or other unpaid inputs, such as operator labor or debt-free facilities. These low returns continue to bring down land values and force lower cash rents.

The variable cost line reflects the total of cash expenditures for fertilizer, pesticides, seed, and drying, which are normally shared according to the terms of the lease on rented farms, plus the cost of fuel, hire, and repairing machinery. Other nonland costs include labor, depreciation, interest, buildings, and overhead.

Total costs per acre in 1985 decreased slightly from these costs in 1984. The record high yield of 171 bushels per acre on these farms resulted in a much lower cost of production in 1985 than in 1984. With a normal yield of 141 bushels per acre on these farms, costs per bushel are now averaging about $1.00 for the variable cost line, $1.85 for the total nonland cost line, and $2.70 for the all cost line.

Figure 2 shows the cost and return per bushel of soybeans produced on these same farms from 1975 to 1985. The total cost line has exceeded returns as shown by the average annual price line each year since 1980 with the exception of 1985. This development reflects large soybean supplies and weak demand. With a normal yield of 44 bushels per acre, costs per bushel are now averaging about $1.80 for the variable cost, $4.10 for the total nonland costs, and $6.75 for the total costs. Total cost per bushel can be expected to go down as rent for the use of land goes down.

COSTS AND RETURNS FROM LIVESTOCK

Livestock also have been important to the current financial status of farm operators. The cost and returns per hundred pounds of pork produced annually from 1975 to 1985 on a sample of 94 farrow-to-finish enterprises with an average of 153 litters per year are shown in Figure 3. Except for 1982, costs have exceeded returns each year since 1978. If average producers used large amounts of borrowed capital and hired labor in the period from 1979 to 1981, they would have had little or no cash left from this enterprise after paying the costs represented by line C. Unless it was possible to use savings, to borrow from the equities in the crop enterprise, or to borrow from a lender during this three-year period, the average producer would have been forced out of business.

The average returns above the cost of feed and purchased animals from about 2,000 individual annual livestock enterprise records from 1981 to 1985 are shown in Table 2. This is the return available to pay for labor, machinery, equipment and building repairs, depreciation, livestock expense, taxes, overhead, and an interest charge on all capital used. There is no profit until these costs are

Costs and Returns—Corn, Soybeans, and Pork

(Shade indicates a deficit below costs on all charts.)

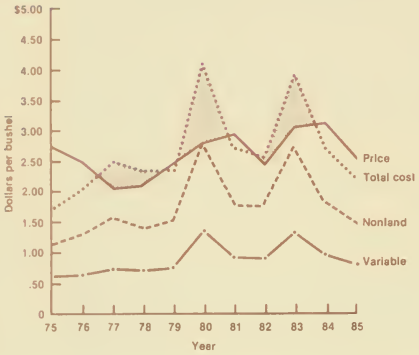

Figure 1. Cost and returns per bushel of corn produced on central Illinois grain farms from 1975 to 1985. Soil productivity rating, 86-100.

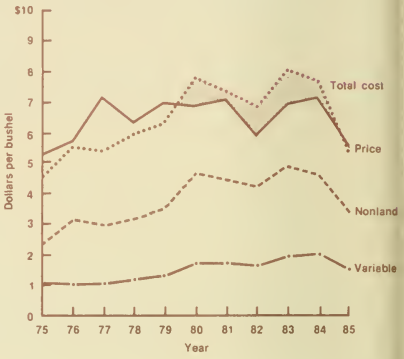

Figure 2. Cost and returns per bushel of soybeans produced on central Illinois grain farms from 1975 to 1985. Soil productivity rating, 86-100.

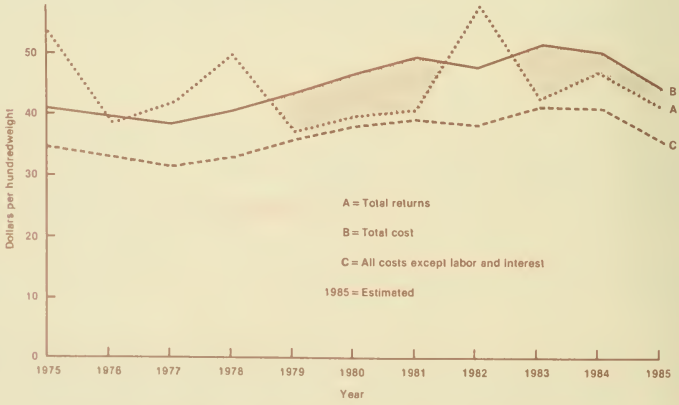

Figure 3. Cost and returns per hundred pounds of pork on farms with under 250 litters from 1975 to 1985.

covered. The returns for the past five years for all enterprises are less than the total cost of production.

Based on the estimates of nonfeed costs in Table 2, the average returns above feed from 1981 to 1985 covering these nonfeed costs for hogs (farrow-to-finish) was $19.20 (costs) minus $17.60 (returns), or a negative $1.60 per hundred pounds. For feeder-pig finishing enterprises, returns above feed averaged $2.21 less than nonfeed costs. Feeder cattle show returns per 100 pounds produced that are $14.73 short of covering costs; dairy returns averaged $43 per cow below costs; whereas beef cow herds are $189 short per cow.

The high interest charges and excess supplies, along with only moderate demand for livestock products, are important factors that contribute to the negative profit margins of all enterprises. Livestock producers who use their own capital without borrowed funds and those producers who are more efficient than the average farmer have been in the best position to cope with these low prices and high costs.

Table 2. Returns above Cost of Feed and Purchased Animals to Livestock Enterprise Units from 1981 to 1985

Year	Farrow to-finish hogs	Feeder-pig finishing	Feeder cattle	Dairy cattle	Beef herd[a]
	-------per hundredweight---------			*-----per cow-----*	
1981.....	$11.45	$ 4.29	$ 3.41	$1,035	$ 1
1982.....	30.43	16.40	19.65	1,043	47
1983.....	12.68	5.26	16.04	885	51
1984.....	16.72	10.98	20.39	995	21
1985.....	16.71	7.00	8.86	1,054	5
5-year average.....	$17.60	$ 8.79	$13.67	$1,002	$ 25
Nonfeed costs, 1981-1985					
Direct cash.....	$ 6.35[c]	$ 4.00[b]	$12.50[c]	$ 320[c]	$ 29[b]
Other cost.....	12.85[c]	7.00[b]	15.90[c]	725[c]	185[b]
Total.....	$19.20	$11.00	$28.40	$1,045	$214

[a]The feed cost for beef herds includes up to $60 of hay equivalent from salvage roughage.
[b]Includes veterinary costs, utilities, fuel, equipment and building repair costs, depreciation, labor, and other nonfeed costs, including interest on feeder livestock, from Table 6, Farm Management Manuals from 1981 to 1985.
[c]Estimates of annual nonfeed costs are based on enterprise cost studies of operative units from 1981 to 1984.

This report based on the summaries of Illinois Farm Business records reviews the financial status of Illinois farm operators over the past four years. Average net farm incomes, although rebounding some in 1985, have been at very low levels in the 1980s and represent a reduction in net worth gains made in the 1970s. Esti

mates indicate that between 4 and 6 percent of the farm operators each year for the next few years may find their net worths too low to be able to stay in business because of the lack of operating funds. Each operator, therefore, should carefully monitor his or her financial position so that business adjustments can be made in a timely and orderly manner based on an analysis of farm income, cash flow, and net worth statements. Although these adjustments may be painful for some, they may make farming more productive and profitable in the future.

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DEPARTMENT OF AGRICULTURAL ECONOMICS
URBANA, ILLINOIS 61801

May 1986

86-8/Economic Multipliers and Agriculture

The farm financial crisis has heightened concern about economic conditions in many areas of Illinois, particularly in those areas that depend mainly on the "basic" (export) activity of agriculture. Agriculture is called a basic activity because most of its output is not consumed within the county: crops are exported and bring new income into it. The impact of the income received from the export of crops and livestock spreads to other sectors linked to agriculture if this initial farm income is respent in the local economy. Employment and income in those sectors will increase both directly and indirectly by some multiple of the increase in the agricultural sector. One economic tool used to estimate the economic effect of changes in basic activities, like agriculture, is a multiplier.

BASIC ECONOMIC ACTIVITIES

One way to analyze and understand the economy of rural counties in Illinois is to use the economic base method, which emphasizes the role of export activities, generally significant sources of income in these counties. According to this method, the economy of the county is divided into basic and nonbasic sectors, that is, those that export and those that serve the local area. It is commonly recognized that some sectors are actually mixed: much of their output remains in the county, but some is exported and draws income into it. Economic activity in a county depends on the export activities of these basic and mixed industries. Agriculture, mining, manufacturing, and the federal government are traditionally considered basic sectors. The federal government is included among the basic sectors because it brings income into the county through social security and other government transfer payments. Construction, trade, services (including insurance and financial services), and state and local governments, are typically considered mixed sectors.

Economic base analysis provides two types of information. The first describes the structure of the local economy in terms of the distribution of employment or income by sector, and the proportion of export activity in each sector. This information helps in understanding the relative importance to a county of various industries, like agriculture. Comparing the economy of a county--sector by sector--to the economies of similar counties reveals the nature and extent of leakages of income and employment, which can be used in identifying and planning feasible areas of economic development. The second type of information is a set of multipliers for individual sectors of the economy.

ECONOMIC MULTIPLIERS

The flow of money from export sales into an area may either leak from the area or be respent locally. The portion that is respent for locally produced goods and services spreads the benefits beyond the initial recipients to other local businesses. Further economic expansion of both basic and nonbasic area businesses occurs as these firms and their employees again respend a portion of the money locally. The total effect of a change in a basic economic activity, therefore, is some multiple of the initial impact.

Economic multipliers may be derived by measuring economic activity in different ways, but typically income or employment is used. An income multiplier may be used to understand the total change in income in a county that is caused by a change in income from an export activity, like farming. An employment multiplier is useful in estimating changes in an area's total employment caused by a change in employment in a county's export sector.

Figure 1 illustrates the concept of a multiplier. Suppose that 40 percent of all revenue that a farmer receives from the sale of a crop to a buyer outside the county is spent locally (within the county where the farm is located). This 40

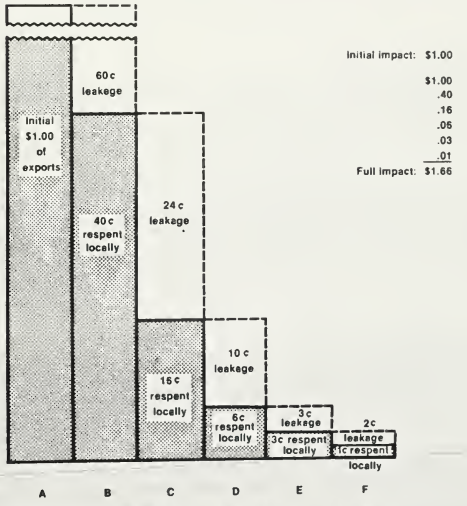

Figure 1. How local respending multiplies the effect of export sales (from) Lewis, Eugene, et al., *Economic Multipliers: Can a Rural Community Use Them?* Western Rural Development Center, Oregon State University, WREP 24, Corvallis, 1979)

percent would be received by firms, banks, and households in the area and by local governments; the remaining 60 percent would leak out of the county as outside purchases and investments and as state and federal taxes. Therefore, in addition to each dollar initially received by the farmer (column A in Figure 1), local respending generates more business activity in the county (column B). Of this 40 cents, suppose that 16 cents is again respent locally (column C) for additional inputs by area firms and for goods and services purchased by their employees, while 24 cents leaks out of the county as purchases of imports--goods and services produced outside the county. This respending generates an additional 16 cents of business activity. The local rounds of respending continue until the amount remaining is negligible (columns D, E, and F). The total impact of each intial dollar received from export sales (the multiplier) in this example is $1.66. This number is obtained by adding the sum of the successive rounds of respending to the initial dollar of export.sales ($1.00 + .40 + .16 + .06 + .03 + .01 = $1.66). If farm sales were to increase, an increase of $1.66 for each dollar of increased export sales could be expected. Greater local respending (and less leakage) in any of the rounds would result in a higher multiplier.

Multipliers identify which industries generate the most local income and employment per dollar received from export sales. They are useful for estimating the total local effects of a change in economic activity in a sector and can be helpful in planning for future demands for services from the private and public sectors.

Because the amount and pattern of expenditures vary across industries, different sectors of the economy have different multipliers. Several factors that influence the size of a sector's multiplier are summarized in the accompanying table. The size of the multiplier reflects the strength of a sector's linkages to the local economy but not necessarily the importance of the sector. If the manufacturing sector has a multiplier of 2.79 and the agricultural sector a multiplier of 1.68, a greater percentage of income received from the export of manufactured goods is spent locally. But the multiplier measures only the impact per unit of change. Despite the larger multiplier for exports of manufactured goods, if agriculture is much larger than manufacturing in a county, agriculture will be more important in generating economic activity because of the greater volume of agricultural goods.

For instance, suppose that the agricultural sector of a rural county has an income multiplier of 1.65 and that its total personal income for a year was $44,112,000. The total income generated in the county from agriculture would be about $72,784,800 ($44,112,000 x 1.65). Suppose also that the manufacturing sector of this county has an income multiplier of 2.79 and that income in manufacturing for that year was $18,530,000. The estimated total income generated in this county from manufacturing would be $51,698,700. Although the impact on the county of a dollar spent in manufacturing is greater, agriculture generates more income.

MULTIPLIERS FOR THE ASSESSMENT OF THE ECONOMIC IMPACT OF CHANGE

Multipliers are frequently employed to forecast the effect of a change in the economic base of a county. For instance, if a county loses 6 jobs in agriculture when two farms are taken out of production and if its agricultural employment multiplier is 1.5, the estimated total impact will be a loss of 9 jobs (6 x 1.5).

Factors Influencing the Size of a Multiplier[a]

Factor	Relationship to the size of the multiplier	
	Directly related	Inversely related
Sector-related factors		
"Leakages"		The higher the tendency for a sector to purchase inputs from outside the region, the lower the multiplier.
Degree of labor intensity	Highly labor-intensive industries tend to have high multiplier values.	
County-related factors		
Population	Highly populated counties tend to have larger, more diversified economies that provide more opportunities for local respending.	
Income		Counties with a high income tend to import more than those with a low income.
Geographic isolation	Counties far from major trade centers tend to have relatively high local purchases and hence, higher multipliers.	

[a]Source: Thomas Mandelbaum, et. al., "Sectoral Output Multipliers for Rural Counties," Oregon State University Extension Service, EC1166, Corvallis, February 1984.

Several problems may arise, however, when economic base multipliers are used to assess economic impacts. First, as a concept, a multiplier is usually valid only in the short run. The value of a multiplier is estimated using data from a specific time period, and it reflects the structure of a local economy at that time. But because technology, demand, and other factors change over time, multipliers become inaccurate. Furthermore, there is often a lag between changes in basic activities and their impacts on other sectors, so the full impact of a change may be felt only in the long run.

Second, problems occur when multipliers estimated for a growing economy are used to predict changes resulting from economic decline. Multipliers for a declining sector are frequently smaller than those for one that is growing. The impact of a change in a declining sector, then, may be overstated if the multiplier for that sector were estimated while the sector was expanding.

Third, it is also important to realize that a change in export activity is not the only factor affecting economic development. For example, in highly populated counties with diversified economies, and in geographically isolated counties far from major trade centers, linkages between industries serving local markets tend to be underestimated so that multipliers are understated.

Economic base analysis provides two types of information: the first helps clarify the importance of the industries in a local economy and helps plan for its development by describing its structure. The second, a multiplier, explains how a basic activity affects the economy of an area. Applied with caution, multipliers can be used to estimate the total local economic impact of a change in the economic activity of an export sector and to plan for future demands for services from the private and public sectors.

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David L. Chicoine

Submitted by David L. Chicoine, Extension Economist

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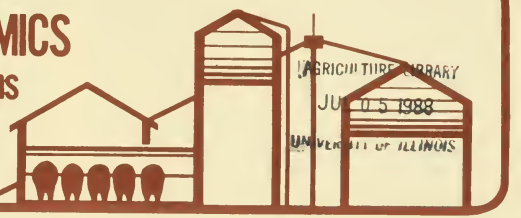

86-9/ THE WHEAT POLL
DO WHEAT PRODUCERS FAVOR MANDATORY LIMITS ON PRODUCTION?

Edward Smith, Extension Economist-Grain Marketing and Policy
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Wheat producers in the U.S. will soon receive a ballot rn USDA asking a question similar to that posed in the t of this article. The poll is being conducted as one of the uirements of the Food Security Act of 1985 (farm bill). ! outcome of the poll, however, does not bind the Secre- u of Agriculture to establish mandatory controls.

The 1985 farm bill states, "Not later than July 1, 1986, n Secretary of Agriculture shall conduct a poll, by mail ot, of eligible producers of wheat to determine whether uh producers favor the imposition of mandatory limits on n production of wheat that will result in wheat prices that rnot lower than 125% of the cost of production (excluding d and residual returns to management) as determined by n Secretary." Only those producers who have grown eat in at least one crop year from 1981-1985 on a farm h a wheat base of at least 40 acres will be eligible to vote.

Although this poll is non-binding, it should not be en lightly. Its inclusion in the farm bill reflects a growing mand for mandatory production controls by producers in wheat industry as well as other producer groups rstrated by surplus production and low farm prices. oducers, therefore, must consider the many consequences ore answering this simple question.

This article explores the question of mandatory oduction controls as well as other supply-management rnatives and their consequences for wheat producers. e purpose of this article is to provide wheat producers h information that should be considered in their decision how to vote. Of course, the discussion in this article uses on the implications of supply control and does not ggest how a producer should vote in the poll.

fore Making the Decision

Most producers would like to have answers to a mber of questions before voting "yes" or "no" on ndatory production controls. Some questions to consider clude:

- What does the Secretary of Agriculture consider to be the cost of wheat production?
- What quantities of wheat would be sold if prices were increased to 125% of this cost of production?
- How much will production need to be cut to maintain the price at 125% of the cost of production?
- What mandatory supply-management options are available?
- What are the consequences of continuing with the current farm program?

These are not easy questions to answer. We consider the following analysis reasonable, given available information.

What is the Cost of Producing Wheat?

There probably are as many answers to this question as there are wheat producers. USDA, however, is required by Congress to estimate the cost of producing wheat, feed grains, cotton, and dairy commodities each year. Based on previous USDA cost of production estimates, we estimate

SPECIAL NOTE TO ILLINOIS FARMERS

About 30,000 Illinois farmers will receive ballots for this 1988 poll. Since the law permits only those with 40 base acres on their farm to vote, smaller wheat growers are excluded. However, if a marketing quota should be announced, the law requires that all farmers who grew wheat in recent years would be eligible to vote.

All those receiving a ballot should be sure to express their views on this issue. More discussion on mandatory acreage controls can be expected in years to come.

the national average cost of producing wheat (excluding land and residual returns to management) to be about $3.23/bushel. The objective of a mandatory production control program, therefore, would be to raise the price of wheat to about $4.04/bushel (1.25 times $3.23/bushel).

How Much Wheat Can Be Sold?

The answer to this question is vital to our analysis since it determines the level of production necessary to sustain a $4.04/bushel market price. Unfortunately, there is no simple answer. The quantity of wheat sold at $4.04/bushel will depend on a myriad of factors affecting the domestic and export sectors. Due to the importance of the answer to this question, further examination of these sectors is warranted.

Domestic Use

Domestic wheat utilization can be categorized into three components: food, seed, and feed. As shown in Figure 1, the major domestic use of wheat is in the food sector. Wheat for food use, however, has been virtually non-responsive to price. Food demand, thus, would be expected to decline only moderately to approximately 650 million bushels if price is increased to $4.04/bushel to the farmer.

Seed use is a function of planted acreage and seeding rate. The planted acreage will vary depending on such factors as grain needs, livestock grazing needs, wheat's use as a cover crop on acres idled under government programs, and wheat's importance in double cropping systems. For the purpose of this analysis, we assume seed usage at 70 million bushels, down 22% from 1985 levels.

Feed use has varied over the last several years (Figure 1) depending on the price relationship between wheat and competing feed grains. If mandatory production controls were implemented for wheat irrespective of the feed grain sector, it is likely that the amount of wheat used as feed would drop significantly. For the purpose of this analysis, we assume annual feed use to decline to 90 million bushels.

Export Use

Since the early 70's when the dollar was allowed to float relative to other currencies, the export sector has traditionally absorbed more wheat than the domestic market. USDA's estimate of 900 million bushels fo 1985/86 marketing year marks the first time since that importers will demand less U.S. wheat than domestic sector. The decline in exports (Figure 1 occurred because of: a strong U.S. dollar, U.S. support levels (loan rates) exceeding world market l foreign competition, and a heavy debt load in many dev ing countries.

The export wheat market is highly competitive increase in the U.S. wheat price would place the U States soundly in the position of a residual suppli conservative response to a U.S. price increase to $ bushel would result in a drop in exports to 750 m bushels.

This analysis suggests that the total demand for wheat could fall by 21% from 1985 levels to approxim 1.56 billion bushels if U.S. wheat prices were suppor $4.04/bushel.

Figure 1. Disappearance and Carryover of Wheat, 1980-1985

How Much Would Production Need to Be Cut

In 1985, U.S. wheat producers harvested 2.43 b bushels from 64.7 million acres. Ignoring, for the mo record levels of carryover (Figure 1), the United S would have to reduce wheat production by about 3 meet the 1.56 billion bushel demand estimated i previous section. Further reduction would be necessa the short run, if the wheat already in government st were allowed to enter the market.

Assuming minimal production control pro slippage (slippage is that portion of reduced acreage does not result in correspondingly lower production due to idling the poorest land) resulting in a 39 bushel average yield, the projected demand of 1.56 billion bu could be produced on 40.0 million harvested acres– 43% of the wheat base for 1986. In other words, 57% wheat base would need to be removed from grain pr tion to support a market clearing price of $4.04/bus

What Mandatory Supply Control Options Are Available?

Mandatory production control programs can many forms. This discussion, however, will foc mandatory acreage controls and marketing quotas analysis in the previous section applies to eit..er fo production control.

USDA may take the position that even if an whelming majority of the farmers vote in fav mandatory production controls, it has no authority to i ment them. The 1985 farm bill contains authori establishing marketing quotas in wheat. USDA's po could be that from a legal perspective, marketing co (quotas) are not production controls. However, conditions of a sufficiently overwhelming favorable the marketing quota authority in the 1985 farm bill still be utilized. Alternatively, Congress could enac legislation authorizing acreage allotments or pro legal interpretation of marketing quotas as a to controlling production.

adatory Acreage Controls

Mandatory acreage controls or allotments would
o' wheat production on a specific number of acres
oed to each farm based on its share of the national
onent necessary to meet the Administration's supply-
rgement objectives. Acreage allotments were used
tsively in the 1950's and 60's and still exist in tobacco.
Experience has shown that when acreage allotments
ed, in the absence of marketing quotas, the program
ffective in limiting production to the desired level.
rers select their best acreage and farm the allotted
ge more intensively. The result is increased produc-
ner acre, requiring further tightening of the allotment
ure years.

If the Secretary determined, as in our analysis, that
of the wheat base would have to be removed from
i production to meet the needs of the market at a price
$.04/bushel, farmers might only be allowed to plant
ct for grain on 43% of their allotted acreage. The
e ion that immediately surfaces is, "What can we do
the idled acreage?" Allowances for use of the idled
ge become extremely important to producers in
tomining their preference for this type of mandatory
gram.

The rules for transfer of the allotment are also very
rtant. If the allotment is tied to the land and non-
ferable, then the price of land tends to be bid-up. If
nents are transferable, then any profits resulting from
lotment will be quickly capitalized into the allotment's
. Is the landowner better off? The answer depends
on what he can do with his idled acreage. If the idled
can be profitably farmed, then the producer would
from the capitalized value of the allotment as well as
the earnings on wheat. If the idled acres cannot be
ed, the capitalized value of the allotment must be
t against the reduced value of land that cannot be
ed and the cost of controlling weeds and erosion on
lled land.

Allotments tied to a specific crop tend to restrict the
er's ability to adjust crop mixes in response to changes
ative crop prices. If idled acreage is allowed to be
ed to alternative crops, furthermore, it could result in
uses for non-allotment crops, thus tending to force
producers to elect allotments for their crops.

The bottom line is that farmers are not automatically
r off from mandatory acreage controls. Whether they
etter off depends on the rules of the game and each
fic situation. At this point, we do not know the rules
r which mandatory controls would operate.

aketing Quotas

It is not surprising that the 1985 farm bill, under its
t title, has a marketing quota section immediately
lowing the section requiring the "Wheat Poll." A
eting quota is a mandatory mechanism which deter-
s the quantity of a commodity that can be marketed.
national quota, set by the Secretary of Agriculture, is
d on the quantity of wheat necessary to meet the
cted market needs, taking into consideration domestic and export requirements as well as emergency food aid needs and adequate carryover stocks.

After the establishment of the national quota, the Secretary would assign a marketing quota for each farm on which wheat was planted or considered planted for harvest during the 1981-1985 base period. The marketing quota would be equal to the product derived by multiplying the farm's base acreage by its farm program yield and reduced by the appropriate percentage necessary to bring national marketing down to the level of national quota. Penalties would be assessed to producers who marketed wheat beyond their assigned quotas.

The Secretary has the authority to announce a marketing quota for wheat to cover the crop years 1987-1990. To implement a quota under the 1985 farm bill provisions, the Secretary must proclaim the national wheat quota by June 15, 1986. He must also conduct, by mail ballot, a marketing quota referendum by August 1, 1986. This referendum is separate from the non-binding poll conducted in June, which is the topic of this paper. The Secretary may proclaim that marketing quotas are in effect for 1987-1990 if he determines that 60% or more of the eligible producers, voting in the referendum, approved marketing quotas. According to the 1985 farm bill, the national quota could be terminated or adjusted in any marketing year the Secretary determines there exists a national emergency or there has been a material change in the demand for wheat. Our analysis indicates that a reduction in export and feed use demand would be likely.

Previous experience with supply control programs indicates that marketing quotas are the most effective means of controlling production because there is virtually no slippage. Quotas are, however, hard to maintain because of political pressure to increase the national quota once it is established.

As was the case with acreage allotments, the use of idled cropland is a big factor in a producer's decision to favor a marketing quota. Many of the same consequences may apply.

In the case of mandatory acreage controls or marketing quotas, the incidence of government involvement in agriculture is high. In terms of taxpayer dollars, however, mandatory programs are relatively inexpensive supply-management alternatives.

What Are the Consequences Of Continuing the Current Program?

The current program calls for voluntary compliance in announced acreage reduction programs in return for direct government income support (deficiency) payments and access to price support loans. In addition, authorization exists for a 45 million acre conservation reserve.

Voluntary acreage limitations call for different levels of idled acreage each year, depending on the projected carryovers. If carryover stocks are expected to exceed 1 billion bushels (highly likely for the next few years), the annual acreage reduction requirement will be between 20-30% (20-27.5%) in 1987 of base acreage. If stocks are expected to be less than 1 billion bushels, the acreage reduction requirements would be not more than 20%.

The conservation reserve program provides for up to 45 million acres of land being taken out of production for a 10 year period. Available USDA data suggest that about 25% of this land (11.3 million acres) would have wheat base. This is about 22% of the land that would be taken out of grain production under a mandatory control program that was designed to raise the price of wheat to $4.04/ bushel. The main question surrounding the conservation reserve program is whether the money is going to be appropriated to remove 45 million acres from production. With potential Gramm-Rudmann-Hollings budget cut restrictions on funding, this program could suffer.

Continuation of the current farm program would likely result in farm level prices being determined by the loan rate for the next few years. In addition, the presence of large carryover stocks would likely lead to further reductions in the loan rate based on the loan rate formula in the 1985 farm bill. It would be difficult for the market to absorb the expected 1.88 billion bushels of stocks on hand as of June 1, 1986, with the acreage reduction requirements called for in the farm bill. Voluntary acreage reduction programs have never been a very effective tool for controlling production due to slippage.

A policy scenario which could lead to different price results involves the implementation of a wheat marketing loan by the Secretary, which is authorized in the 1985 farm bill. Initial indications are that in rice, where the mari loan is currently in effect, exports increase as market fall to the world price level. Government pay initially rise sharply, offsetting the fall in market Once stocks are drawn down, however, market should rise above current levels. Regardless of wheth marketing loan is used, the current program w relatively costly to the U.S. treasury.

Conclusions

The "Wheat Poll," although non-binding, coul important implications for future wheat program market says we have overproduced. Effectively ma mandatory production controls provide an orderly get resources out of agriculture.

The decision to vote in favor or against man production controls is multi-faceted. Producers consider the short- and long-run consequences of n tory supply controls versus the current program. Th choice is between the current voluntary progran relatively high government costs and lower market and a mandatory program that costs less but could re relatively higher prices, lower export and feed de and considerably lower production. In any event, as political issue, it is important that farmers mak preference known.

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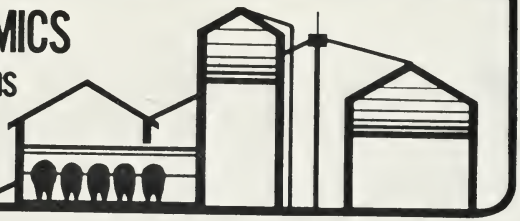

July 3, 1986

86-10/International Markets for Corn and Soybeans

Since 1973, export markets have absorbed about one-quarter of U.S. corn production and two-thirds of soybean production. In the last few years, low prices and large carryouts of corn and soybeans have raised concerns that export markets for feed grains will not be large enough to both absorb U.S. production and maintain farm income. Corn exports in 1984-85 were 25 percent less than their peak in 1979-80, and soybean exports in 1984-85 were 35 percent less than their peak in 1981-82. Total world market demand for both corn and soybeans has been sluggish. The total world trade of corn has declined since 1980, and the total trade of soybean protein has increased only slightly in the last 5 years.

The 1985 farm bill lowered loan rates in a bid to recapture export markets. Whether this lower price will increase export volume depends upon how U.S. prices influence international prices and how import demand and export supply from other countries respond to price change. Predicting this response is difficult because each country differs and the mix of trading countries changes over time. This newsletter looks at (1) the changes in our customers and competitors; (2) the ways in which international prices are determined; and (3) the implications for future U.S. exports and prices.

WHO IMPORTS OUR CORN AND SOYBEANS?

The composition of world corn demand has changed over time. The European Economic Community (EEC) was a major customer during the 1970s, but recently has purchased very little corn (Table 1). The EEC's Common Agricultural Policy (CAP) protects domestic grain production, leading to increased domestic supply of grains. EEC farmers' response to higher prices has been boosted in recent years by European agricultural research that has raised yields. Japan is now our most important single customer and has recently taken one-quarter of our exports. Japan also protects its agriculture but does not produce feed grains. Japanese policy makers have chosen to protect domestic livestock production and allow virtually free trade of feed grains to support the domestic livestock industry. The USSR is another important customer, but Soviet demand varies widely with production. U.S. sales to newly industrialized countries in Asia and Latin America are small but of increasing importance.

Regional exports of soybeans and soybean meal have not changed as much as corn exports. The principal customers for whole beans are the EEC and Japan, while soybean meal exports go to the EEC and other European countries (Table 1). In

Table 1. Exports by Region, 1973-84 (Percent of Total U.S. Exports)[a]

	1973 to 1977	1978 to 1982	1983	1984
CORN				
Region/Country				
EEC	34	16	9	7
Japan	18	20	27	28
USSR	11	14	6	22
Other Asia	7	13	21	13
Other Europe	16	19	14	9
Latin America	6	8	16	10
Other	8	10	7	11
	100	100	100	100
Type of Economy				
Less-developed	13	21	38	28
Developed	70	53	51	49
Planned	17	26	11	23
	100	100	100	100
SOYBEANS				
Region/Country				
EEC	46	44	38	34
Japan	21	18	20	22
USSR	2	3	2	0
Other Asia	10	12	14	14
Other Europe	12	15	19	18
Latin America	2	4	6	10
Other	7	13	18	22
	100	100	100	100
Type of Economy				
Less-developed	8	13	18	22
Developed	87	80	76	74
Planned	5	7	6	4
	100	100	100	100
SOYBEAN MEAL				
Region/Country				
EEC	60	53	62	40
Japan	3	3	0	0
USSR	0	0	0	0
Other Asia	1	4	6	18
Other Europe	23	23	12	10
Latin America	6	10	14	20
Other	7	7	6	12
	100	100	100	100
Type of Economy				
Less-developed	7	15	20	38
Developed	76	67	71	53
Planned	17	18	9	9
	100	100	100	100

[a]Source: USDA, *Foreign Agricultural Trade of the United States.*

contrast with corn, demand for soybean protein has remained high in the EEC because few domestic substitutes exist, and there are no import tariffs for soybeans.

Domestic vegetable oils in the EEC are protected, so that some processors benefit from importing whole beans and selling both oil and meal. This processing does not meet the demand for soybean protein in feeds. Therefore, additional soybean meal is imported into the EEC. Japan has protected its domestic soybean processors, confining import demand to whole beans.

Over the past few years, developing countries have taken an increasing share of imports for both corn and soybean protein (Table 1) and this trend should continue. With rising income, many developing countries experience rapid growth in the demand for meat and need increasing amounts of feed grains. Future growth in the feed grain import demand most likely will occur in rapidly growing low and middle income countries.

WHO COMPETES WITH US IN EXPORT MARKETS?

The U.S. has dominated total world trade in corn and soybeans from the late 1960s to the present. Argentina is our most important competitor in the corn market, but even in recent years, the Argentines have not supplied more than 10 percent of the world trade (Table 2). South Africa supplies Europe small amounts of high-quality corn, and Thailand competes in the East Asian markets. Subsidized exports from France have increased in recent years with the growth in production under the CAP.

Table 2. U.S. and Competitor's Share of World Trade (Percent of Total World Trade)[a]

	1968 to 1972	1973 to 1977	1978 to 1982	1983	1984
CORN					
U.S.	51	67	74	69	72
Argentina	14	9	8	9	8
South Africa	6	4	5	2	0
France	9	5	4	6	8
Thailand	5	4	3	4	5
SOYBEANS					
U.S.	92	80	84	86	76
Argentina	0	1	9	5	12
Brazil	3	16	3	5	6
China	4	2	1	1	3
SOYBEAN MEAL					
U.S.	67	46	37	29	22
Argentina	0	1	3	7	12
Brazil	12	32	39	38	37
Northern Europe[b]	17	17	18	19	18

[a]SOURCES: FAO, *Trade Yearbook*; USDA, *Foreign Agricultural Trade of the U.S.*
[b]Includes Belgium, Netherlands, Denmark, and West Germany. These apparent large exports reflect trade within the EEC. Processors near the North Sea ports crush imported soybeans and then export meal to other countries within the EEC.

Over the last 15 years, Argentina and Brazil have emerged as major competitors in the soybean and soybean meal markets (Table 2), now supplying a total of about 15 percent of soybeans and 45 percent of soybean meal exports. In contrast with the U.S., Brazil exports more soybean meal than soybeans.

Not surprisingly, the U.S. dominance of the world feed grain market has been challenged by countries in the southern hemisphere that have a similar climate and abundant land. Recent studies by the USDA have shown that U.S. production costs are low, however, and thus, the U.S. is likely to remain the market leader.

An additional and less obvious source of competition comes from within importing countries. Most countries are reluctant to rely on the world market for a major portion of their food needs because of a concern for food security. The high prices and crop failures of the early 1970s led many countries to invest in agriculture and provide price protection to producers. Food production outside the U.S. has grown generally at 4 percent per year, which is faster than population growth. Many former food importers, particularly in Asia, are now self-sufficient. This increase in supply reduces the total world demand for grain.

WHAT DETERMINES WORLD FEED GRAIN PRICES?

In any year, the U.S. corn price, reflecting domestic supply and demand as well as government policy, sets the general level of world prices. Since the U.S. supplies more than two-thirds of the world corn trade, competitors cannot charge substantially more than the U.S. price, since importers would shift to the U.S. If competitors charge less than U.S. prices, they do not have enough supply to force down U.S. prices. U.S. soybean prices also determine world market prices, but competitors in the soybean protein market have a large enough share to influence prices when their production changes.

The domestic price for corn or soybeans in an importing country equals the U.S. price plus transport costs, converted to local currency. Many importing countries also impose a tax in order to insulate their domestic producers from world prices. Feed millers (and other customers) within an importing country then decide how much to import based on the domestic price. The total amount that is imported will depend upon the surplus of domestic demand over the supply at the domestic price.

Consider an example of imports into Europe. In February 1986, corn in Central Illinois was $2.33 per bushel or $92 per metric ton (mt). Corn shipped from Gulf ports was $2.62 per bushel, or $103 per mt. U.S. corn unloaded at Rotterdam was $117 per mt after shipping costs. A levy (import tax) of $101 per mt was charged, so the price in Europe becomes $217 per mt. When converted into German marks (DM), the price is DM 486: the price that would be paid by a feed miller in northern Europe.

The levy on corn imported into the EEC varies inversely with world prices in order to maintain a high, stable price within Europe. Thus, changes in the U.S. corn price are not reflected in the EEC corn price and do not alter import demand.

Soybeans, on the other hand, enter the EEC without any import tax, and prices in Europe vary with U.S. prices. In February 1986, soybeans were $5.25 per bushel at Central Illinois or $193 per mt. At the Gulf, soybeans were $5.63 per bushel or $207 per mt. Transport costs to Rotterdam brought the price to $216 per mt, which is DM 484 in local currency.

This example shows that the U.S. domestic price or loan rate is only one determinant for the prices paid by importers. The price paid by importers will also depend on the exchange rate of the U.S. dollar to local currency and on import policy. Because the U.S. dollar exchange rate has fluctuated much more than domestic corn or soybean prices in recent years, it has had a significant impact on the prices importers pay, and therefore on import demand. The major exception is the corn market in the EEC, where the CAP insulates grain prices from changes in world prices.

From 1976 to 1980, the dollar declined in value against the DM and the Japanese Yen (Table 3). U.S. products became cheaper for our major customers, even though U.S. domestic agricultural prices were rising. During this period, exports of soybeans to the EEC and of corn and soybeans to Japan both increased substantially (Table 3). From 1981 to 1984 U.S. macroeconomic policy led to a doubling in value of the dollar against other currencies. Corn and soybean prices converted to foreign currency increased much more than domestic prices (Table 3). Soybean exports to the EEC declined, while the rate of export growth of both products to Japan slowed.

Table 3. Percent Changes in Prices and Quantity of Imports[a]

	1976 to 1980		1981 to 1984	
	Corn	Soybeans	Corn	Soybeans
JAPAN				
Imports from the U.S.	85	31	15	6
Price				
due to exchange rate	-25	-26	8	8
due to export price ($)	11	21	4	-2
Total Price (yen)	-14	-5	12	6
EEC				
Imports from the U.S.		34		-33
Price				
due to exchange rate		-31		26
due to export price ($)		20		-2
Total Price (DM)		-11		24

[a]SOURCE: United States Department of Agriculture, *Foreign Agricultural Trade of the United States* (various issues), International Monetary Fund, *International Financial Statistics* (1985), United States Department of Agriculture, *Grain Market News* (various issues).

WHAT ARE THE IMPLICATIONS FOR FUTURE EXPORT POTENTIAL?

Recently, the dollar has declined sharply in value. The additional decline in prices brought about by the lower loan rate in 1986 will lead to border prices that are about 50 percent lower in 1986 than in 1985. This should stimulate demand, particularly for soybeans. The impact of these price declines will not be seen immediately, however, because the world supply of grains is very large this year, depressing the total world demand.

Unfortunately, the change in the dollar exchange rate will not discourage competitors. Most of these countries have currencies that continue to devalue against the dollar. Argentine and Brazilian producers will see some decline in price due to the fall in the U.S. loan rate, but not as much as the decline in prices faced by importers. Thus, most of the adjustment to the price change will be in import demand rather than in foreign production.

It takes time for world supply and demand to respond to price changes. The current price decline should have two long-run effects. First, lower prices make it more expensive for the EEC to subsidize exports, putting pressure on the EEC budget, and on policy makers to reduce agricultural prices. It is unlikely that the EEC will dismantle its CAP, but perhaps EEC domestic prices will not rise as quickly in real terms or the EEC will impose production quotas. This would lead to a modest recovery in EEC demand for corn.

Second, lower prices should encourage industrializing countries with growing feed grain demand to rely on imports. Long-run demand prospects for soybeans may be better than those for corn, because fewer substitutes exist for soybean protein. The U.S. will remain the world's largest supplier of feed grains, but the 1970s rapid growth in world markets is unlikely to be repeated in the near future.

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July 1986

86-11/Farm and Family Sources and Use of Dollars, 1982-1985, Illinois Farms

In 1985 the total, noncapital, family-living expenses of farm operators within a group of 313 record-keeping farms averaged $24,235, or $2,020 per month per family (see Table 1). The farms were located primarily in central Illinois. This average was unchanged from 1984, 3.9 percent higher than 1983, and 8.7 percent nigher than for 1982. Another $2,991 was used to purchase capital items such as the personal share of the family automobile, furniture, and household equipment. Thus the grand total for living expenditures averaged $27,226 for 1985 compared with $26,713 for 1984, or a $513 increase per family. Expenditures for capital items increased $525 per family, while noncapital expenses decreased $12 per family.

How these families use their funds depends somewhat on the levels of net farm and nonfarm incomes and the priority of the expenditure. In this sample, the 1985 net farm incomes increased $12,104 per farm over 1984, but net nonfarm incomes decreased slightly from the record high levels of 1984. Most of the farms in the sample were classified as grain farms and were located in a 15-county area bounded by Jacksonville, Peoria, Champaign, and Mattoon. This area had excellent grain yields in 1985, with many of the corn yields averaging from 160 to 170 bushels per acre.

Although the amount of interest paid per farm increased from $20,651 in 1984 to $22,144 in 1985, there was no change from 1984 to 1985 in interest expense as a percentage of farm receipts (14.4 percent) or as a percentage of cash operating expenses (18.6 percent). Farm receipts per tillable acre increased $7; cash operating expenses, including interest, increased $4. Interest payments per tillable acre increased from $34 to $35, while noncapital living expenditures decreased from $40 to $39 per tillable acre. Machinery and building purchases remained at low levels, dropping from $15,871 in 1984 to $15,589 in 1985.

Based on data recorded by the farmers and then edited by the Farm Business Farm Management (FBFM) Association field staff, the sample of farms showed an average debt of 63 cents for each $1 of farm assets as of December 31, 1985; machinery was valued on a cost-less-depreciation basis. A year earlier the debt was 54 cents for each $1 of farm assets. This debt-to-farm asset ratio would be lower with machinery valued at a current market value. Bringing in nonfarm assets would also lower the ratio.

Table 1. Average Farm and Family Sources and Uses of Dollars and Living Expenditures for 1982 through 1985 and by High and Low Noncapital Living Expenses

	All records, average per farm				Family of 3 to 5, 1985[a]	
	1985	1984	1983	1982	High third	Low third
Number in sample	313	286	257	195	72	72
Tillable acres farmed	629	602	601	606	800	491
Acres owned	119	112	128	122	122	108
Farm assets, January 1[b]	$368,344	$411,320	...[c]	...[c]	$396,199	$295,494
Farm assets, December 31[b]	374,126	402,024	...[c]	...[c]	401,111	298,589
Liabilities, January 1	220,968	212,048	$227,749	$210,515	263,001	165,600
Liabilities, December 31	234,155	219,049	223,757	227,064	284,215	175,439
Net farm income	25,677	13,573	...[c]	...[c]	29,114	17,713
SOURCE OF DOLLARS						
Net nonfarm income	$ 8,721	$ 9,208	$ 6,873	$ 8,202	$ 6,911	$ 10,341
Money borrowed	137,065	96,895	81,460	120,741	192,695	92,321
Farm receipts	157,042	146,213	148,671	149,695	195,633	122,005
USES OF DOLLARS						
Interest paid	$ 22,144	$ 20,651	$ 22,812	$ 22,644	$ 28,822	$ 16,887
Cash operating expenses	96,761	90,621	84,680	90,769	124,481	78,352
Capital farm purchases	15,589	15,871	15,338	21,988	16,307	11,832
Payments on principal	123,430	90,191	85,006	104,192	171,569	82,023
Income and social security taxes	4,358	4,823	4,255	4,802	4,454	3,122
Net new savings and investment	13,320	3,446	-1,582	9,599	13,050	12,768
LIVING EXPENSES						
Contribution	$ 1,145	$ 1,121	$ 1,154	$ 1,095	$ 1,631	$ 626
Medical	3,146	3,126	2,774	2,656	3,913	2,348
Insurance, life and disability	2,209	2,197	2,104	2,021	3,124	1,155
Expendables	17,735	17,803	17,303	16,528	24,738	13,705
Total noncapital expense	(24,235)	(24,247)	(23,335)	(22,300)	(33,406)	(17,836)
Capital	2,991	2,466	3,160	2,344	3,150	1,849
Total, living expenses	$ 27,226	$ 26,713	$ 26,495	$ 24,644	$ 36,557	$ 19,685
TOTAL NONCAPITAL LIVING EXPENSES, PERCENT CHANGE	0.0	3.9	4.6	1.6		

[a]Records were sorted into high- and low-third categories according to total noncapital living expenses.
[b]Modified cost basis, except bare land values, was held at current values between January 1 and December 31
[c]Data not available.

The farms in this sample were 63 acres larger than the average for the 7,500 farms in the FBFM record-keeping program. Crop yields averaged about 5 percent above those reported by the Illinois Crop Reporting Service. These factors, when combined with the fact that the area sampled had the highest corn yields in Illinois in 1985, resulted in the net farm income averaging $3,640 above the average of all Illinois record-keeping farms. As long as this level of income persists, the average living expenditures for farms in this sample are estimated to be 15 to 20 percent above the average of all Illinois farm operators having more than $40,000 gross sales per farm.

In 1985 the operators of these 313 farms averaged 43 years of age. The family averaged 3.6 members, with the age of the oldest dependent child being 10 years. They farmed 629 tillable acres, 119 of which they owned, or 19 percent of this land. The operators kept records so that all sources of funds, both farm and nonfarm, balanced with all uses of funds in a complete monthly cash-flow accounting system.

In the table, the averages per farm for total family living expenses are divided into five categories for 1982 through 1985. The "expendables" category includes cash spent for food, operating expenses, clothing, personal items, recreation, entertainment, eduation, and transportation. Cash spent for capital improvements exceeding $250 is not included. The value of farm-furnished meat amounted to an estimated $200 average per farm. The use of a rented house on an estimated 40 to 50 percent of the farms in this sample is not included, since these data cover only cash outlays.

The excess of nonfarm taxable income over nonfarm business expense was $8,721 in 1985, or 32 percent of the total living expense; in 1984 the excess was 34 percent. It includes dividends on stocks, interest on savings and money-market funds, income from other nonfarm investments, and income from off-farm work performed by family members. Interest earned and left in savings accounts not included in the cash flow is not reflected in the nonfarm income.

One of the more significant observations about this group of 313 farms is that farm assets continued to drop while liabilities increased compared with a year earlier. The value of farm assets on December 31, 1985, was $27,898 less than a year earlier. The decline reflects the continued drop in land values. At the same time, liabilities increased by $15,106. The $15,589, or $25 per tillable acre, spent on capital purchases for machinery and equipment remained at about one-half the level of capital purchases common before 1980.

As in recent years, interest payments continued to be the highest single farm expense. Interest includes that paid on operating, intermediate, and real estate debt. Interest paid increased from 12 percent of total farm operating expense in 1979 to 21 percent in 1983 and 19 percent in 1984 and 1985. The $22,144 interest payment in 1985 was 14 percent of total cash farm receipts, the same percentage as in 1984.

The records from farm families with three to five persons were sorted into two categories, the high-third and the low-third, according to their noncapital living expenses. The total living expenses for the high-third group averaged $36,557, compared with $19,685 for the low-third group. The high-third group farmed 309 more acres than the other group and owned 15 percent of the land farmed; the low-third group owned 22 percent of the land farmed. The larger farms in the first

group had more income for living expenses and income tax. Net farm plus nonfarm income was $36,025 for the high-third group compared with $28,054 for the low-third group. The average age of operators in the high-third group was 43 and the number of family members was 4.1 compared with 39 years of age and 3.8 family members for the other group.

Narrow profit margins are expected over the next few years because of low commodity prices. It is therefore important that more farmers learn how to balance and monitor their cash low each month. Computer program assistance is now becoming available in more service centers such as some FBFM Association district offices. These centers are prepared to offer services to help farmers project monthly cash flows on computer printouts so that they can compare projections with their actual results.

For farm operators with low equity or very high debt-to-asset ratios, this type of accounting is essential. These operators need to account for all of their sources and uses of funds to assist them in making sound financial management decisions.

The data summarized in this process may also serve as a guide in budgeting allowances for family living expenses. For families in this sample, the family living expenses totaled $43 for each tillable acre farmed. If the net nonfarm income of $14 per tillable acre is used for living, $29 per tillable acre would have to be generated from the farm business to meet family living requirements. Each family must determine how much each acre of crop or each litter of hogs should contribute to their family living. This amount, when added to production costs and other obligations, can help to determine break-even prices needed for products sold.

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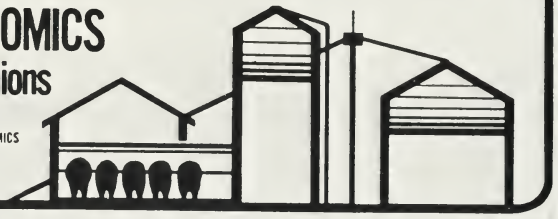

July 25, 1986

86-12/Soil Conservation Laws and Major Programs

A negative byproduct of farming is soil erosion. On the farm, soil erosion can rob a soil of its productivity. The U.S. Department of Agriculture estimates that the Corn Belt states will lose 6 percent of the 1982 yields over the next 100 years, given current soil erosion rates and technology. In addition, detached soil particles find their way into our nation's lakes and waterways, creating damages in other sectors of the economy and environment. Edwin Clark et al., in their book entitled *Eroding Soils: The Off-Farm Impacts*, provide a glimpse of the magnitude of off-farm damages created by a yearly national erosion rate exceeding 6 billion tons. Excluding biological impacts, the authors estimate off-farm damages of between $3.2 billion and $13 billion annually in 1980 dollars. Their best guess is $6.1 billion, or about one dollar for every ton of eroded soil. USDA estimates that 29 percent of the on-farm and off-farm damages occurs in the Corn Belt states.

In response to a potentially serious problem, state and federal governments are taking steps to reduce erosion. This newsletter highlights major changes as they apply to Illinois farmers. First, we review Illinois's T-by-2000 guidelines and use recent survey results from the 1982 National Resource Inventory to put the soil erosion problem in perspective. Second, the conservation section of the Food Security Act of 1985 is discussed. Finally, in the last section we discuss state and federal conservation programs.

T-BY-2000: ILLINOIS EROSION CONTROL GUIDELINES

Passed in 1977 by the General Assembly, the Illinois Erosion and Sediment Control Program and Standards law gave the Illinois Department of Agriculture (IDOA) responsibility to draft a set of erosion control guidelines that would bring soil erosion to T (tolerance levels) values by the year 2000. T represents the maximum annual rate of soil erosion that could occur and not cause a decline in long-term agricultural productivity. On April 18, 1980, IDOA drafted State Erosion and Sediment Control Guidelines. Over the next two years, local soil and water conservation districts (SWCD) adopted similar or more stringent guidelines. On January 1, 1983, IDOA published state guidelines (Table 1). By 2000, all soils should be at or below T, which ranges from 1 to 5 tons per acre per year, depending on soil type.

How does T-by-2000 affect citizens of Illinois? The 1982 National Resource Inventory survey furnishes some answers. Excluding federal land, 35,137,200 acres of land in Illinois are devoted to cropland, forest land, pastureland, and other

Table 1. State Guidelines for Erosion and Sediment Control in Illinois

	Land with slope 5 percent	Other land
	tons/acre/Yr	
January 1, 1983	≤ 4 T (4 to 20 tons)	≤ 4 T (4 to 20 tons)
January 1, 1988[a]	≤ T (1 to 5 tons)	≤ 2 T (2 to 10 tons)
January 1, 1994	maintain ≤ T	≤ 1.5 T (1.5 to 7.5 tons)
January 1, 2000	maintain ≤ T	≤ T (1 to 5 tons)

SOURCE: IDOA, "T by 2000."

[a]Soil erosion should be reduced to T on gently sloping soils (soil with 5 percent or less slope) where erosion can be controlled with conservation tillage.

uses. Total rural acreage comprises 31,936,900 acres. For all acres, annual erosion equals 6.3 tons per acre; total yearly erosion equals 200.7 million tons.

The magnitude of the erosion problem by rural land use category is shown in Table 2. To comply with T-by-2000 guidelines, 11.2 million acres require a conservation system that uses one or more conservation practices. Less than two years away, 1988 guidelines suggest that 8,021,448 acres with a slope of less than or equal to 5 percent should be at or below T. Hence, by 1988, 90 percent of Illinois's rural land should be at or below T (IDOA, "T-by-2000"); the remaining 10 percent, no more than 2 T.

One should point out that the Illinois Erosion and Sediment Control Program and Standards guidelines are voluntary. A complaint process exists and any person or group can file a complaint. Your local soil and water conservation district investigates complaints, offers technical assistance if guidelines are violated, and identifies cost-share programs to ease the financial burden. Failure to cooperate within one year can lead to formal local meetings and a formal state meeting conducted by IDOA, with all recommendations being made public. The final step in the complaint process is referral of the case to the Illinois Pollution Control Board. If a link can be made between erosion and water quality, the board may be able to enforce the guidelines shown in Table 1. As of June 1986, 114 complaints filed at local SWCD offices never reached the public meeting phase. Land users in all cases agreed to follow conservation plans recommended by the local SWCDs.

FOOD SECURITY ACT OF 1985: PUBLIC LAW 99-198

Three components of the act relevant to landowners are the conservation compliance, "sodbuster," and "swampbuster" provisions. Landowners who violate any of the provisions are not eligible to receive commodity price support payments, production adjustment payments, farm storage facility loans, disaster payments, federal crop insurance payments for storage of Commodity Credit Corportion grain, annual payments through the Conservation Reserve Program, and other unmentioned program benefits. The Agricultural Stabilization and Conservation Service (ASCS) waived enforcement of the sodbuster provision for the 1986 crop year. However, the land must have a conservation plan applied for the 1987 crop year if the farmer is to remain eligible for federal program assistance.

Interim regulations that define highly erodible land and wetlands, discuss exceptions, and outline procedures were published in June 1986. The important definitions and relevant provisions follow.

Highly Erodible Land

Highly erodible land is defined by using parts of the universal soil loss equation (USLE), the wind erosion equation (WEQ), and a soil's assigned T value defined previously. The relevant formulas are:

(1) $\text{Soil erosion index} = \frac{R \times K \times LS}{T}$ $\begin{cases} \geq 8\text{: highly erodible} \\ < 8\text{: not highly erodible} \end{cases}$

(2) $\text{Wind erosion index} = \frac{C \times I}{T}$ $\begin{cases} \geq 8\text{: highly erodible} \\ < 8\text{: not highly erodible} \end{cases}$

USLE (equation 1) represents tons of soil loss per acre per year for fallow land. USLE takes into consideration rainfall and runoff (R), a soil's resistance to erosion (K), and slope and length interactions (LS). USLE addresses only sheet and rill erosion. The wind erosion index (equation 2) consists of two factors: C characterizes windspeed and surface soil moisture and I represents the degree to which a soil resists wind erosion.

For either wind or water erosion, an erosion index greater than or equal to 8 signifies highly erodible land. In other words, land that has an average annual erosion potential equal to or greater than 8 times its T value is highly erodible and must be in compliance. (For specific details about the USLE, T values, and examples, consult Cooperative Extension Service Circular 1220, "Estimating Your Soil Erosion Losses with the Universal Soil Loss Equation.")

A field is classified as highly erodible if at least 33.33 percent of the field acreage is identified as highly erodible or if a field contains 50 or more acres of highly erodible land. Field boundaries can be modified subject to a written request submitted to and approved by (ASCS).

Table 2. Estimated Average Annual Erosion in Relation to T Value, by Rural Land Use, 1982

	Cropland	Pastureland	Forest land	Other rural land	Total
Less than T					
1,000 acres	14,500.0	2,688.3	3,034.4	513.6	20,736.3
1,000 tons	37,040.1	1,989.8	1,786.4	273.2	41,089.5
Tons per acre	2.6	0.7	0.6	0.5	2.0
T to 2 T					
1,000 acres	5,506.6	203.4	128.7	31.4	5,870.1
1,000 tons	33,838.9	1,221.6	711.9	713.2	35,945.6
Tons per acre	6.2	6.0	5.5	5.5	6.1
Greater than 2 T					
1,000 acres	4,720.8	265.6	266.3	77.8	5,330.5
1,000 tons	101,522.0	6,206.2	10,176.9	5,807.5	123,742.6
Tons per acre	21.5	23.4	38.2	74.7	23.2
Total 1,000 acre	24,727.4	3,157.3	3,429.4	622.8	31,936.9

SOURCE: 1982 National Resource Inventory data summarized in Table 2 of publication "T-By-2000."

Conservation Compliance

The conservation compliance provision addresses the problem of highly erodible land in the production of annual crops such as corn, soybeans, wheat, cotton, and sorghum grains or land considered planted before December 23, 1985. Compliance can take one of three forms:

1. Land bid into the Conservation Reserve Program (CRP) is in compliance. At the end of the ten-year CRP contract, a producer must fully implement an approved conservation plan or lose government program benefits.

2. For highly erodible land that has a detailed soils map and is not bid into the CRP, landowners have until January 1, 1990, to begin implementing an approved conservation plan; otherwise, they lose program eligibility. Landowners must have fully implemented an approved conservation plan by January 1, 1995, or lose federal program benefits.

3. For highly erodible land that does not have a detailed soils map, landowners must begin an approved conservation plan two years after completion of a soil survey or lose eligibility for program benefits. Landowners have until January 1, 1995, to complete application of the conservation plan or again face ineligibility.

Sodbuster Provision

Highly erodible land not in production of annual crops or not considered planted as of December 23, 1985, must have an approved conservation plan fully implemented before crop production can be initiated; otherwise, landowners immediately lose federal program benefits. Farmers who plowed out land from December 23, 1985, to June 27, 1986, will be exempt from these provisions for one crop year only: a plan must be fully implemented in 1987 for the farmer to retain government program benefits. A summary of the compliance and sodbuster provisions is shown in Table 3.

Table 3. *Target Dates for the Compliance and Sodbuster Provisions of the Farm Act of 1985*

	Conservation plan developed	Conservation plan applied
Conservation compliance		
Highly erodible land in production of annual crops or considered planted before Dec. 23, 1985		
CRP acreage	Contract termination	Before land is put back in production
With soils map	Before Jan. 1, 1990	Before Jan. 1, 1995
Without soils map	2 years after mapping	Before Jan. 1, 1995
Sodbuster provision		
Highly erodible land ..... not in production or not considered planted before Dec. 23, 1985	Before land is put in production	Before land is put in production

Landowners who already have implemented a conservation plan on their lands remain eligible to receive federal program benefits. Furthermore, conservation compliance and sodbuster provisions are not applicable to landowners who do not participate in federal government programs or who, because of the high cost of conservation practices, decide in the future not to participate in federal farm programs. These provisions simply state that if you want to participate in federal farm programs, then you must use environmentally sound practices on land defined as highly erodible.

Wetlands and Converted Wetlands

Wetland is any land that contains a predominance of hydric soils and supports a prevalence of hydrophytic vegetation under normal circumstances. Hydric soils are soils saturated, flooded, or ponded long enough to support growth and regeneration of hydrophytic vegetation during a growing season. Hydrophytic vegetation consists of plants that grow in water or in a soil substrate that is periodically deficient in oxygen because of too much water.

Converted wetland is any wetland drained, dredged, filled, leveled, or otherwise manipulated to make agricultural production possible. Land in this classification is subject to the following conditions: first, production was not possible before conversion and, second, before conversion the land was wetland and not highly erodible land or highly erodible cropland.

Swampbuster Provision

Any person who produces an agricultural commodity on wetland converted after December 23, 1985, is ineligible to receive federal program benefits. Ineligibility continues until the person converts the land back to wetlands. A person does not lose eligibility if wetland conversion started before December 23, 1985, nor does a person lose eligibility if a contract to convert a wetland was signed before that date.

ASCS waived enforcement until the interim rules were published in June 1986. Once again let me point out that the swampbuster provision currently binds only individuals who want to participate in federal farm programs.

LAND RETIREMENT AND COST-SHARE PROGRAMS

People interested in voluntarily following T-by-2000 guidelines and in participating in federal farm programs can join the Conservation Reserve Program or choose from a variety of cost-share conservation programs. Brief descriptions of major programs follow. For more information, visit your local soil and water conservation, county Extension, ASCS, and SCS offices.

Conservation Reserve Program (CRP)

During policy deliberations on the Food Security Act of 1985, legislators, environmental groups, soil conservation groups, and farm groups broadly supported a program designed to retire highly erosive land. Reacting to concern about our nation's ability to maintain productive capacity in the future, to mitigate off-farm damages caused by sediment and related contaminants, and to stabilize the boom-bust cycle in the agricultural sector, these groups successfully lobbied for a comprehensive conservation section. Conservation compliance, sodbuster, and swampbuster form one component. CRP forms the second half. Subject to funding constraints, CRP can remove up to 45 million acres from annual production between 1986 and 1990.

RP is a voluntary program designed to remove highly erodible land from produc-
ion. The Secretary of Agriculture exercised his right to define highly erodible
ands during the first two sign-up periods. He used T values and the Land Capa-
ility Class System, which divides land into eight capability classes. Capability
lass I is prime land with slopes of less than 2 percent. Land assigned in pro-
ressively higher numbered classes becomes progressively more unsuitable for crop
roduction. Class VIII land is unsuitable for any crop production. Future sign-
ps may use the same definition, other definitions such as the one found in the
odbuster provision, or the original definition of two times T found in the law
nd interim rules. The main program components are summarized in Table 4.

articipation in CRP depends on land eligibility requirements and USDA acceptance
f your contract offer. Before the first sign-up, USDA divided Illinois into
hree bidding pools that reflected differences in land quality and earning poten-
ial. Within each pool and during a sign-up period, landowners or tenants with
andowner approval submit a contract at their county ASCS office, stating that
hey will remove a specified number of erosive acres from annual production for a
pecified yearly per acre payment. After the sign-up period closes, USDA chooses
ontracts that satisfy program eligibility requirements and do not exceed a pre-
etermined per acre bid cap. Maximum acceptable bids and a list of counties in
ach pool as of the last two sign-up periods can be found in Table 5.

nder current definitions of eligibility, 3,053,200 acres of Illinois land quali-
ies for the program. The first sign-up period, from March 3 to 14, 1986, pro-
uced disappointing results on the national and state level. Only 828,387 acres
ere accepted into the program nationwide, far short of USDA's 1986 goal of 5 mil-
ion acres. Illinois acreage accepted into CRP amounted to only 17,239 acres.

SDA reviewed the results of the first sign-up, interviewed farmers throughout the
ation, and scheduled another sign-up for May 5 to 16, 1986. For the nation
,000,681 acres and for Illinois 31,054 acres were tentatively accepted into the
986 and 1987 CRP program years. The final number of acres accepted depends upon
CS's verification of land eligibility for acres without a current soil survey.
llinois farmers' activity in the two sign-ups by bidding pool is summarized in
able 6.

he 1987 CRP sign-up begins August 4 and ends August 15, 1986. Several important
oints require highlighting. First, Illinois might have four bidding pools rather
han three pools. USDA must approve the request submitted by the state ASCS of-
ice. The proposed change simply tries to bridge the gap between pool 2 at $80
nd pool 3 at $60. Boundaries do not change for pools 1 and 2. Furthermore, a
ounty cannot be reassigned to another pool that has a lower bid cap. At this
tage, all we know about the proposed new pool bid cap is that it will be between
60 and $80. Counties that might be included in the new pool are indicated in
able 5.

econd, before the third sign-up, SCS determined if a field was eligible (greater
han 3.5 T), questionable (greater than 2.5 T and less than 3.5 T), or ineligible
less than 2.5 T) for CRP. Fields placed in the "questionable" category required
field visit by SCS to calculate the erosion level. The "questionable" category
s now greater than 2 T and less than 3.5 T. Furthermore, gully erosion can be
sed to move a field out of the "questionable" category to the "eligible" cate-
ory. If the district conservationist discovers a significant amount of gully
rosion during the visit to a field and soil is eroding between 2 T and 3 T, the
onservationist can declare the field eligible for CRP.

Table 4. Components of the Conservation Reserve Program

	Components
Eligibility requirements	
1. Land	Land classified as VI, VII, or VIII. Or land classified as II, III, IV, or V with erosion exceeding 3 times the T level. Or combination of the above.
2. Production	Planted or considered planted to a commodity at least 2 years between 1981-1985. And physically able to produce a crop.
3. Predominance test	At least 2/3 of a field must be highly erodible. If an existing field is greater than 9 acres, it can be redefined to meet predominance test.
4. Ownership-operator	Land must be owned or operated by applicant on or before Jan. 1, 1985. Or land must be owned or operated at least 3 years before signing contract. Or land was acquired by will or by succession as a result of death.
5. Tenant-landlord	Tenant or share cropper and landowner must agree on fair and equitable distribution of annual rental payment.
Compensation	
1. Procedure	Applicant submits bid that reflects profitability plus other factors considered important. ASCS accepts bids that meet requirements and do not exceed bid cap. CRP acres cannot exceed 25 percent of a county's production acreage.
2. Compensation	Generic PIK certificate for annual rental payment. Maximum $50,000 annual CRP payment per person. Payment on or shortly after Oct. 1 each year. Gramm-Rudman-Hollings not applicable unless certificate held required minimum time and cashed at ASCS office. Hunting fees-leases acceptable.
3. Cost-share	50 percent cost-share for cover establishment and for conservation structures required to establish cover.
Contractual agreement	
1. Contract period	10 years.
2. Cover crop	Owner or operator agrees to establish and maintain cover for duration of contract. Cover crop can be grasses, legumes, wildlife habitat, field windbreaks, trees.
Contract violations	
1. Erosion	Cover crop not maintained.
2. Illegal compensation	Grazing the land; harvesting hay or seed; planting Christmas trees, vineyards, ornamentals, orchards, or nut trees.
3. Violation penalties	Applicants may be required to refund cost-share funds and annual rental payments.
4. Liquidation damages	25 percent of annual rental payment.

Table 5. Illinois Counties and Bid Pools

Pool 1, bid cap of $80	Pool 2, bid cap of $90	Pool 3, bid cap of $60
Adams	Bureau	Alexander
Boone	Champaign	Bond
Brown	Christian	Clark[a]
Calhoun	Coles	Clay
Carroll	DeKalb	Clinton
Cass	De Witt	Crawford[a]
Cook	Douglas	Cumberland[a]
DuPage	Edgar	Edwards
Fulton	Ford	Effingham[a]
Greene	Henry	Fayette[a]
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Mercer		Randolph
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Peoria		St. Clair[a]
Pike		Saline
Putnam		Union
Rock Island		Wabash[a]
Sangamon		Washington
Schuyler		Wayne
Scott		White
Stephenson		Williamson
Tazewell		
Warren		
Whiteside		
Will		
Winnebago		
Woodford		

[a]Counties that might be placed in another pool that has a bid cap between $60 and $80.

Table 6. Summary of Illinois's Participation in CRP

Pool no.	March 3 to 14, 1986, sign-up				May 5 to 16, 1986, sign-up		
	Max. bid	Acres offered	Acres accepted	Av. bid	Acres offered	Acres accepted[a]	Av. bid
1	$80	41,131	5,348	$68.52	17,525	10,841	$76.69
2	90	15,553	2,114	80.12	4,729	2,159	87.67
3	60	80,109	9,777	53.27	36,007	18,064	58.43
Total ...		136,793	17,239	61.29	58,261	31,064	66.83

[a]Tentatively accepted acres.

Third, past evidence suggests that all submitted bids below or equal to USDA's established maximum bid are accepted. Hence, the rule of thumb is to submit a bid if profits from crop production are less than the maximum dollar amount set by USDA for your pool.

Conservation Practices Program (CPP)

Funded with appropriations from the "Build Illinois" program, the Conservation Practices Program (CPP) receives $10 million over five years beginning in fiscal year 1986. The objectives of CPP are to provide financial assistance to land users who install costly conservation practices and to help meet Illinois's T-by-2000 guidelines. All 98 soil and water conservation districts receive a share of the money based on the percentage derived from dividing total acres exceeding T in a district by total acres exceeding T in the state. Every district, however, receives at least $10,000 in cost-share funds.

Maximum state cost-share rates for most conservation practices are 75 percent of average costs. Several exceptions are worth noting: the establishment of contour farming ($5 per acre for one year), contour strip cropping ($10 per acre for one year), and permanent vegetation (75 percent not to exceed $100 per acre). For land classes VI through VIII, the state limits use of cost-share funds to practices that convert land to less intensive uses such as permanent vegetative cover. Every SWCD can set lower cost-share rates if local conditions warrant the change.

Landowners or renters with landowner approval can apply for and receive state CPP funds, providing they are SWCD cooperators, have a conservation plan on file, and have land with erosion rates exceeding T values. Applications must be made at your local SWCD office. Landowners or renters can enter into multiyear agreements. Maximum length is five years for contracts signed in 1986. Multiyear agreements signed in 1987 and beyond cannot exceed the number of years remaining in the CPP program.

Landowners or renters who sign contracts with their local SWCD agree to maintain the installed conservation practices for the life of the contract, ten years after installation of the last practice. In addition, land users agree to continue complementary practices such as conservation tillage if these practices were part of the conservation plan. Landowners or renters who fail to abide by contract terms must reimburse cost-share funds to the SWCD.

Illinois Watershed Land Treatment Program (WLTP)

Funded from the "Build Illinois" program at $10 million over five years, WLTP focuses soil conservation on critical watersheds throughout Illinois. Within a watershed, landowners or renters with landlord approval can apply and receive cost-share funds for lands with at least a 2 percent slope and eroding above T values. Again, a land user must be a SWCD cooperator and have a conservation plan on file before requesting cost-share funds. State cost-share rates, conservation practices, contract life, and penalties are the same as those found in the Conservation Practices Program.

One major difference in WLTP is solicitation of state funds. Soil and water conservation districts must prepare and submit an application to their area land use councils. The application must describe the geographic area, quantify resource concerns and needs, identify necessary conservation practices and costs to achieve T values, and outline a time frame for completing the project. The land use councils then prioritize the applications and make recommendations to the state Watershed Priority Subcommittee, which in turn makes recommendations to the Soil Erosion and Water Quality Advisory Committee. The Illinois Department of Agriculture makes the final selection of priority watersheds on the basis of recommendations from the advisory committee.

The selection process is competitive and depends on several related criteria: reduction in erosion and sedimentation per cost-share dollar, achievement of T-by-2000, presence of a lake, municipal water supply, or other impoundment, an educational component, outside funding, willingness and ability of a SWCD to complete a funded watershed resource plan, and land user support. To date, 60 watershed projects have been fully or partly funded with "Build Illinois" funds distributed by IDOA.

Agricultural Conservation Program (ACP)

USDA's Agricultural Stabilization and Conservation Service (ASCS) administers ACP. ACP provides cost-share funds to encourage voluntary compliance with federal and state conservation regulations, to control erosion and sedimentation, to improve water quality, and to maintain soil productivity. Each year, county ASCS committees choose eligible practices from an approved state list of acceptable practices and assign cost-share rates to the eligible ones. Land users must file annually for federal assistance if they do not have a long-term agreement (LTA) with ASCS. LTAs cover three to ten years, and applicants file only once for approval and assistance over the life of the agreement. Cost-share rates under the annual and LTA programs are between 30 and 75 percent of average costs. Under special circumstances, low income producers can obtain 80 percent cost-share rates. Yearly payments to a producer cannot exceed $3,500.

Application for cost-share funds and final payment involve several steps. Any landlord, owner, tenant, or share cropper can file for federal cost-share funds at their ASCS county office. After a land user files for assistance, the Soil Conservation Service (SCS) determines if the practices are feasible and estimates costs. The county ASCS committee then approves or rejects the request and notifies the applicant. Applicants who begin installation before written approval are not eligible to receive cost-share funds. If the application is approved, SCS develops a practice plan in accordance with its technical guide and local regulations. The land user installs or hires a contractor to install the practices. SCS certifies that the installed practices meet technical specifications and local

regulations. Finally, the land user submits bills to ASCS for reimbursement according to established cost-share rates. Land users who accept cost-share funds agree to maintain the installed practices for a specified number of years or refund all federal funds.

Other Programs

Other special programs disburse cost-share funds. For example, land users located within the boundaries of Illinois's five PL-566 Watershed Protection Projects can apply to the Soil Conservation Service for cost-share funds in their specific watersheds. An excellent example of state, federal, lake homeowner association, and farmer cooperation can be found at Apple Canyon Lake, located in Jo Daviess county. For further information about special projects in your watershed or county, contact your local farm adviser, SWCD, or SCS.

SUMMARY

Soil erosion decreases agricultural productivity and in some instances causes substantial damages in other sectors of the economy. The time has come to develop a long-term strategy for erosion control. Once you construct a strategy, examine current cost-share programs and the Conservation Reserve Program. Since these programs change regularly, call your local Extension, SCS, and ASCS representatives for the most recent changes and benefits of each program. Join those programs, that can maximize long-term farm profitability and viability, given current state and federal guidelines and regulations.

REFERENCES

Clark II, Edwin, Jennifer A. Haverkamp, and William Chapman. Eroding Soils: The Off-Farm Impacts. Harrisonburg, VA: R. R. Donnelley & Sons Co. 1985.

Illinois Cooperative Extension Service. Estimating Your Soil Erosion Losses with the Universal Soil Loss Equation (USLE). Circular 1220. University of Illinois at Urbana-Champaign. 1983.

Illinois Department of Agriculture. Soil and Water Conservation District Administrative Guidelines for the Illinois Conservation Practices Program and the Illinois Watershed Land Treatment Program for Cost-Sharing Soil Erosion Control. Springfield: IDOA. August 1985.

Illinois Department of Agriculture. T-By-2000: A State Plan For Meeting "T" or Tolerable Soil Losses in Illinois by the Year 2000. Springfield: IDOA. March 1985.

U.S. Department of Agriculture. 1985 Agricultural Chartbook. Washington D.C.: U.S. Government Printing Office. 1985.

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FARM ECONOMICS
Facts and Opinions

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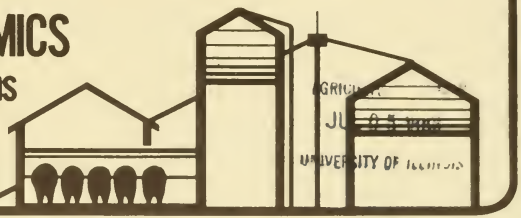

August 1986

86-13/Illinois Farm Property Tax Levels

Begun in 1984, the reversal of the long-standing trend of ever-increasing property taxes on Illinois farmland continued in 1985. The poorly performing farm economy is placing downward pressure on farmland assessments. Countering the lower assessments are tax rate increases by schools, townships, and counties. The outcome of lower assessments and higher tax rates was a slight decline in average per acre property taxes for 1985. Property taxes on Illinois grain farms declined an average of 30 cents per acre, from $15.63 per acre in 1984 to $15.33 in 1985. The average decline from 1983 to 1984 was 12 cents per acre.

The per acre property taxes for a sample of Illinois grain farms for 1975 to 1985 are shown in Figure 1. Also included in Figure 1 are data for the sample farms in the 68 northern counties and the 34 southern counties. In 1985, the sample included 1,892 grain farms, which totaled 1.4 million acres of land. Because of higher building assessments, per acre property taxes for livestock farms will average above these levels.

The historical difference between per acre property tax levels in southern and in northern Illinois continues. The 1985 per acre property tax on northern Illinois grain farms was $19.53, compared with an average of $8.97 reported for southern Illinois. One major reason for this difference is the difference in soil productivity between northern and southern parts of the state. Without dramatically higher property tax rates in southern counties, farm property taxes there will continue to be less than in the northern region.

FARM PROPERTY TAXES AND SCHOOLS

Of course, the property tax is the major source of tax revenue for school districts and other local governments. In Illinois, there is a growing concern for the financial health of rural governments, particularly schools, resulting from the poor farm economy. School districts are very dependent on the property tax, and lower farm assessments result in less revenue unless tax rates are increased. On average, about 75 cents of every dollar of property taxes paid by farm property taxpayers is spent by schools (Figure 2). In 1983, farm property taxpayers spent an estimated $326 million on rural schools. A major determinant, then, of the level of farm taxes is the spending of rural schools. In 1985, the average reduction of 30 cents per acre in farm taxes reflects declines in assessments because of the financial stress facing Illinois agriculture. For rural schools, the reduction amounts to an estimated revenue loss of $6.9 million annually.

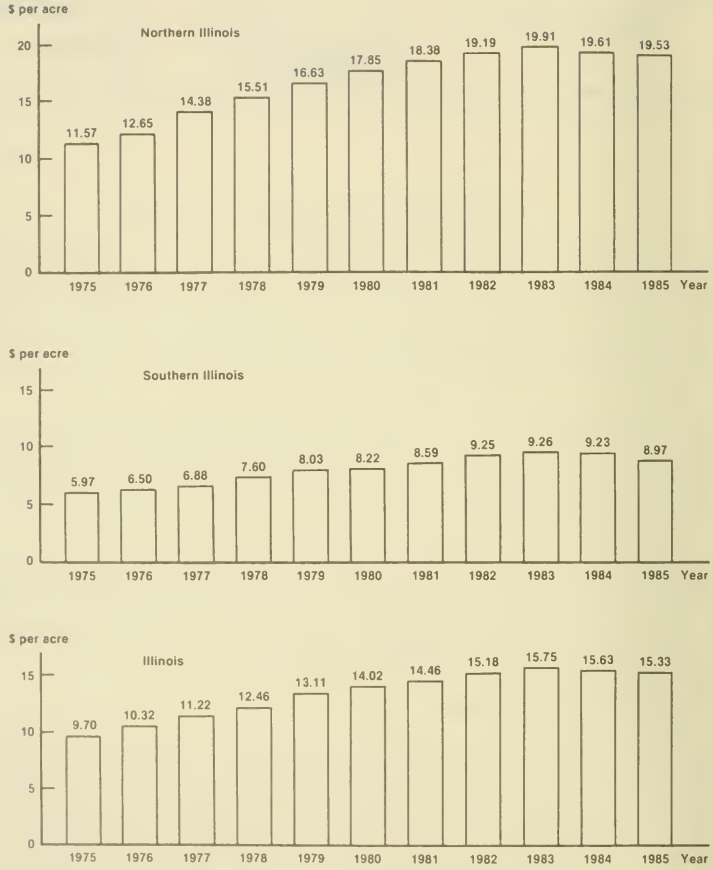

Figure 1. Per acre property taxes on Illinois grain farms, 1975 to 1985.

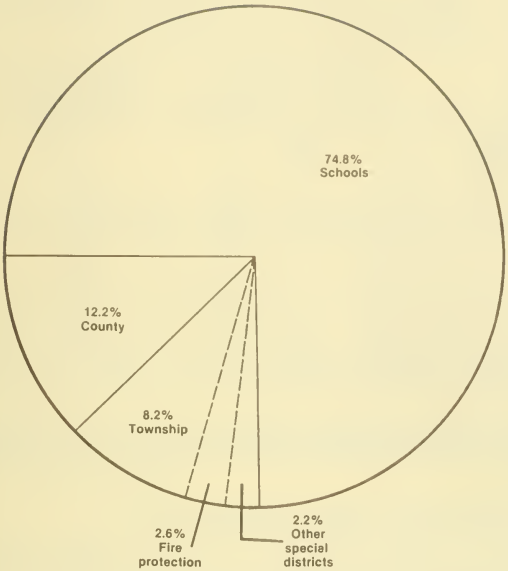

Figure 2. Estimated distribution of 1983 farm property tax extensions.

The changes in farm assessments and average farm property tax rates from 1981 to 1984 are given in Table 1; 1984, the most recent year for which complete assessment data are available, is the base for 1985 taxes. Reflecting the recessionary economy of Illinois agriculture, farm assessments declined 15.3 percent from 1981 to 1984. The largest decline was between 1983 and 1984. During these four years, rural schools and other governments lost approximately $1.5 billion in farm property tax base.

In 1984, concern for the financial health of rural schools and other local governments was the major reason for legislation that limited the change in farmland assessments to 10 percent from one year to the next. The limit law, which was the focus of legislation again in 1986, can provide rural schools only short-term insulation from the fundamental economic changes taking place on Illinois farms. The weak farm economy will reduce the fiscal capacity of all rural local governments, including school districts.

Table 1. Change in Illinois Farm Real Estate Assessments and Average Tax Rates, 1981 to 1984[a]

Years	Percent change in farm assessments	Percent change in average tax rates
1981-1982	-3.80	2.75
1982-1983	-4.77	4.54
1983-1984	-7.50	4.73

[a]Decline in farm assessments between 1981 and 1984 is 15.3 percent. Increase in average tax rate between 1981 and 1984 is 12.5 percent (13.9 percent between 1980 and 1984).

Countering the assessment declines has been a steady increase in tax rates as schools and other governments try to maintain revenues. Between 1981 and 1984, average tax rates on farm property increased 12.5 percent, with nearly a 5 percent increase between 1983 and 1984. In 1980, 29 Illinois counties reported an average tax rate at or above 5 percent for farm property. In 1983, the average tax rate on farms was 5 percent or more in 60 of Illinois's 102 counties.

Most tax rates are limited by law. A referendum is required to exceed the limit. Rate increases in recent years suggest that referenda will be required to raise tax rates significantly in the future, unless the General Assembly changes the rate limits.

EFFECTIVE TAX RATES AND FARM TAXES IN NEIGHBORING STATES

On way to measure the property tax burden on farms in Illinois is to use the effective property tax rate. The effective rate compares property taxes to land values. These rates for the last eleven years are presented in Table 2. Between 1981 and 1985, effective tax rates for Illinois farmland increased 69.6 percent (from 0.56 percent to 0.95 percent). This increase, which occurred after a 41 percent decline in the effective tax rate between 1975 and 1981, reflects rather stable per acre property taxes combined with a significant reduction in Illinois farmland values. As land values continue to adjust to the economic conditions on farms and without significant changes in the finance policies for schools and other local governments, effective property tax rates on Illinois farms can be expected to continue to increase during the rest of this decade.

Comparing property tax levels among midwestern states shows a general trend toward higher effective tax rates on farms in all states (Table 3). The increase in effective tax rates between 1981 and 1983 ranged from 42.5 percent in Indiana to 5.7 percent in Iowa. In terms of average per acre taxes, only Illinois, Iowa, and Missouri were reported by the U.S. Department of Agriculture to have lower taxes in 1983 compared with 1981. All other states reported tax increases between 1981 and 1983. In five out of eight midwestern states, property taxes on farm real estate increased while the farm economies in these states were under substantial economic stress and while the market value of farmland was declining. These seemingly inconsistent trends result from the operations of the property tax systems in the respective states. Current conditions in the farm economy take time to be reflected in the assessment of farms and, eventually, in property taxes. Sooner or later, farm assessments will decline. Without rate increases, the decline will lower farm taxes.

Table 2. Effective Property Tax Rates on Illinois Farms, 1975 to 1985

Tax year	Effective tax rate, percent[a]			Property taxes as percent of land rent[b]
	Northern Illinois	Southern Illinois	Illinois	
1975.....	1.12	0.99	1.11	13.49
1976.....	1.02	0.88	0.96	11.74
1977.....	0.93	0.75	0.86	15.00
1978.....	0.74	0.62	0.72	15.29
1979.....	0.72	0.59	0.68	14.18
1980.....	0.69	0.54	0.65	15.11
1981.....	0.60	0.49	0.56	17.41
1982.....	0.58	0.51	0.56	18.66
1983.....	0.66	0.56	0.64	17.06
1984.....	0.85	0.72	0.82	19.04
1985[c]....	0.99	0.84	0.95	17.86

[a]Effective tax rate is property taxes as percent of farmland, computed using only grain farms.
[b]This percentage refers to a group of northern and central Illinois grain farms. Land rent is the landlord's crop-share rent and includes property taxes.
[c]Land rent for 1985 is estimated.

Table 3. Per Acre Taxes Levied on Farm Real Estate: Illinois Versus Selected States, 1983

	Dollars per acre		Effective tax rate	
	Amount, 1983	Change, 1981 to 1983	Amount, 1983	Change, 1981 to 1983
		percent		*percent*
Illinois.....	$13.55	3.8	0.78	18.2
Indiana.....	8.53	9.4	0.57	42.5
Iowa.....	8.84	-14.3	0.56	5.7
Michigan.....	23.03	12.1	2.08	24.6
Minnesota.....	6.34	20.8	0.60	39.5
Missouri.....	2.64	-10.5	0.35	12.9
Ohio.....	8.51	2.2	0.66	37.5
Wisconsin.....	15.32	6.2	1.50	14.5

SOURCE: Unpublished USDA data.

More frequent reassessment shortens the time between economic changes and changes in property taxes. The annual reassessment of farmland in Illinois results in economic conditions on farms being quickly reflected in property assessments. Higher tax rates can of course result in higher taxes, even if assessments are declining.

SUMMARY

The economic troubles faced by many Illinois farmers during the 1980s are slowly and adversely affecting the ability of rural schools and other local governments to finance demanded services. Tax rate increases in general have not been great enough to offset the drop in farm assessments, resulting in the continued decline in per acre farm taxes that began in 1984. Steady and slightly lower property taxes combined with falling land values to increase the effective property tax rate on Illinois farms in the early 1980s by nearly 70 percent. The restructurin under way in Illinois agriculture presents state policymakers with a property ta paradox: increasing farm tax burdens and lower per acre farm taxes. Without fundamental changes in the method of financing Illinois schools, the effective property tax rate on farms will continue to increase while the fiscal capacity of rural schools and other local governments erodes.

The weak farm economy is lowering farm assessments and will probably continue to do so for several more years. Because schools depend on the property tax, the weak farm economy will reduce the capacity of rural schools, as well as other rural governments, to finance expenditures. Lower farm property taxes may margin ally improve the financial position of Illinois farmers, but the associated fisca pressures on rural schools will challenge state government policymakers to evaluate the current approach to financing schools in both rural and urban Illinois in 1987. Tax policy initiative and leadership will be required to address the "farm property tax paradox" because the renascence of rural Illinois's economy will include major structural changes in the farm sector. The farm property tax capacit now being lost will most likely not be restored.

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FARM ECONOMICS
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Valuing Farm Input Handbook
Section 4 - No. 1

86-14/*Guide for Adjusting Custom Rates and Machine Rental Rates for* 1986-87

Custom field operation rates are charges made for the use of field equipment, the time of the operator, necessary mechanical power, other supplies furnished, such as tractor fuel, wire or twine for baler, and an allowance for risk and overhead. Rental rates are for the use of the power unit and the machine only. There are two methods of establishing the charge for a particular operation. One is the market rates charged. The other is the cost of performing the operation or providing the machine services.

CUSTOM RATE COST INDEX

In the absences of current market rates, index numbers of prices paid by farmers for selected classes of expenditures can be used to adjust historical market rates for increased costs. Index of prices paid by U.S. farmers for selected production items directly related to the costs of providing custom farm operations are presented in Table 1. The weightings of the four items for the calculated custom rate cost index are as follows: tractors and self-propelled machinery 30%; other machinery and implements 25%; fuel and energy 15%; and farm wage rates 30%. The base for each index is 1977. The data in the column -- percent change from previous year -- uses the previous year as the base. The custom rate cost index assumes custom rates are based on costs of performing operations and no change in the efficiency of performing the operation.

Table 1. CALCULATED CUSTOM RATE COST INDEX & ANNUAL CHANGE, 1977-1986

Year	Index for Prices Paid by U.S. Farmers for Production Items 1977 = 100 a/				Estimated custom rate cost index b/	Percent change from previous year
	Tractors and self-propelled machinery	Other machinery & implements	Fuel and energy	Wage rates		
1977	100	100	100	100	100.0	---
1978	109	108	104	107	107.4	7.4
1979	121	119	137	117	121.7	13.3
1980	136	132	188	126	139.8	14.9
1981	152	146	213	136	154.8	10.7
1982	165	160	211	143	164.0	5.9
1983	174	171	202	148	169.6	3.4
1984	181	180	201	151	174.8	3.0
1985	178	183	201	154	175.5	.4
1986c/	175	184	160	164	171.7	-2.2

FOOTNOTES: (a) Source: Agricultural Prices, SRS, USDA. (b) Tractors and self propelled machinery weighted by 30%; other machinery and implements 25%; fuel & energy 15%; and wage rates 30%. (c) January-June estimates.

COSTS OF OWNING AND OPERATING POWER AND IMPLEMENTS

The cost of using replacement machines is another guide to establishing and adjusting custom rates. The short cut method of computing the direct use costs for individual power units and implements is illustrated by the example in the form on page two.

The direct use costs for typical sized machines at current replacement cost and at average performance levels are presented in Table 2. These direct use costs include depreciation, interest, insurance, repairs, fuel and labor. There has been no allowance for profits, management, overhead or risk in these calculations.

There are three direct use values presented in Table 2. The value in the first column covers all direct use costs of power, implement, fuel and labor. The data in the second and third columns are for situations where the power and equipment units are rented out. Costs for both the tractor and implement are included in the second column. The third column has the ownership and operating costs for the implement only.

METHOD OF COMPUTING DIRECT COSTS OF OPERATING POWER AND IMPLEMENTS
(+ Estimated return for management, overhead and risk)

	Power unit (tractor or self-propelled unit)	Implement	Total
. Machine	TRACTOR	Chisel Plow	
. Size	180 HP	15 ft.	
. Purchase price	$70,000	$4,250	
. Ownership and repair cost (see Table A)	.0004	.00177	
. Hourly ownership and repair cost (3 x 4)	$28.70	$7.52	
. Fuel and lubrication, cost per hour[a]	$10.21	$ -	
. Total power and implement, cost per hour (5 + 6)	$38.91	+ $7.52	= $46.43
. Labor cost per machine-hour on the job[b]			$ 8.66
. Total costs per machine-hour on the job for operation (7 + 8)			$55.09
. Units of work per machine-hour on the job (acres, bushels, tons, bales)[c]			6.5 Units
. Total cost per unit of work (9 ÷ 10)			$ 8.47
		10% rate	25% rate
. Adjustment for risk, time for moving from job, other overhead, and profit margin [line 11 x (10 to 25%)]		$	$
. Estimated machine hire rate per unit of operation		$	$

a 180 PTO HP x .069 for gasoline, .0504 for diesel, .0823 for LP gas x 1.00 for ave. load, 1.25 for heavy load, .75 for light load x $.90 price per gallon = $10.21 fuel cost per hour

b $8.25 wage rate x 1 no. of workers x 1.05 for tillage operations, 1.10 for harvesting operations, 1.20 for planting, spraying = $8.66 labor cost per machine hour

c 180 width in inches x 4.5 m.p.h. speed x .80 field efficiency x .01 = 6.5 acres per hour

Table A. Amount of Assumed Use, Assumed Ownership and Repair Costs Per Hour, Per Dollar of the List Price and Rates of Performance Coefficients to be Used in Estimating Costs of Operating Power and Implements

	Number of years of use	Annual hours of use	Cost of ownership and repair per hour, per dollar of list price	Speed (MPH)	Field-efficiency coefficient
Tractor	10	400	.00041	...	...
Basic combine	5	250	.00094	...	...
Corn head	5	150	.00167	2.7	.65
Grain head	5	100	.00217	3.0	.70
Heavy tillage tools 1/	10	100	.00177	4.5	.80
Light tillage tools 2/	10	100	.00150	5.0	.80
Planter only	8	75	.00278	4.5	.70
Planter with attachments	8	75	.00278	4.5	.65
Grain drill	8	75	.00278	4.5	.70
Fertilizer equipment	8	75	.00256	4.5	.65
Spraying equipment	8	75	.00276	5.0	.65
Mower	10	100	.00175	5.0	.80
Mower - conditioner	10	100	.00167	5.0	.80
Hay rake	10	100	.00167	5.0	.80
Hay baler, forage wagon	10	100	.00153	3.5	.75
Forage harvester, blower	10	100	.00166	2.5	.60
Grain wagon	10	100	.00150	...	...
Manure spreader	10	100	.00156	5.0	.70
Liquid manure spreader	10	100	.00156	...	...

1/ Includes moldboard plow, chisel plow, field cultivator, and row cultivator.
2/ Includes disk harrow, spike tooth harrow, and rotary hoe.

NOTE: Costs were based on 5, 8, or 10 years of depreciated life, an interest rate of 12 percent, insurance at 1/2 percent, and housing at 1 1/2 percent of the remaining value of the beginning of the year. The purchase price was assumed to be 90 percent of the manufacturer's list price, plus freight and the dealer's setup cost.

Table 2. -DIRECT COSTS OF MACHINE SERVICES (excluding Management, Overhead and Risk) (Guide to Custom and Rental Rates for Farm Equipment)[a]

Field Operation	*Unit*	*Power, machine fuel and labor Costs*	*Power and machine costs*	*Machine costs only*
TILLAGE OPERATIONS				
Moldboard plowing	acre	$ 13.25	$ 9.25	$ 4.00
Chiseling, 8"-10"	acre	8.50	5.50	1.25
Coulter chiseling	acre	11.00	7.50	3.00
Field cultivation	acre	5.25	3.50	1.50
Offset disking-reg.	acre	7.50	5.00	2.00
-deep	acre	11.00	7.75	3.50
Tandem disking	acre	6.00	4.00	2.00
Disking & applying insecticide & herbicide	acre	7.50	5.25	3.00
Combination tool (disc-cult-level)	acre	7.50	5.00	2.25
Packer mulching	acre	5.00	3.25	1.75
Stalk shredding	acre	5.50	3.50	1.50
Row cultivating	acre	6.25	4.25	1.75
Rotary hoeing	acre	1.75	1.15	.50
TILLING AND PLANTING				
Field cultivating and planting corn or soybeans	acre	13.00	10.75	8.00
Packer mulching and drilling soybeans	acre	12.00	9.25	6.75
PLANTING				
Planting corn or soybeans only	acre	9.50	7.75	6.50
Planting corn or soybeans & applying chemicals	acre	10.50	8.50	7.25
No till planting	acre	12.50	10.50	8.50
Drilling small grain	acre	8.50	6.00	4.25
No till drilling	acre	13.50	10.75	8.50
Power till seeding	acre	12.50	9.50	7.25
Broadcast seeding	acre	1.50	.60	.15
APPLYING FERTILIZER				
Anhydrous ammonia	acre	5.00	3.50	2.00
Mixed dry fertilizer	acre	2.00	1.25	.60
SPRAYING (excluding materials)				
Field spraying	acre	3.25	2.00	1.00
Fence row spraying	hour	27.50	----	----
Rope wick applying	acre	2.75	1.00	.20

(This table is continued on the next page.)

Table 2. - *DIRECT COSTS OF MACHINE SERVICES (excluding Management, Overhead and Risk) (Guide to Custom and Rental Rates for Farm Equipment)a/*

Field Operation	Unit	Power, machine fuel and labor costs	Power and machine costs	Machine costs only
HARVESTING GRAIN				
Combine soybeans or wheat	acre	$ 24.00	$ -----	$ 20.00
Combine corn	acre	29.00	-----	24.50
Combine and store	bu.	.30	-----	-----
Pick ear corn	acre	36.00	26.00	16.00
Pick and store ear corn	bu.	.40	-----	-----
Haul grain	bu.	.09	.06	-----
Dry grain	bu. point	.0225	-----	.012
HARVESTING FORAGES				
Mowing Hay	acre	5.00	2.50	1.10
Mow, condition, windrow	acre	8.25	5.50	3.50
Raking hay	acre	4.50	2.25	1.00
Baling sq. bales-wire tie	bale	.32	.16	.09
-twine tie	bale	.24	.13	.07
Baling large round bales	bale	4.75	3.00	1.75
Stacking (1 1/2 tons)	stack	7.00	4.75	2.75
Stacking and moving	stack	9.00	5.75	3.00
Field chop only - corn silage - 2 row chopper	hour	49.00	36.00	24.00
	ton	2.70	2.00	1.30
Silo filling with 2 row chopper wagons & blowers	hour	89.00	-----	-----
	ton	4.90	-----	-----
TRACTOR RENTAL				
50 PTO H.P. 2 W.D.	hour	$ -----	$ -----	$ 6.00
60 PTO H.P. 2 W.D.	hour	-----	-----	9.00
85 PTO H.P. 2 W.D.	hour	-----	-----	12.00
105 PTO H.P. 2 W.D.	hour	-----	-----	15.00
130 PTO H.P. 2 W.D.	hour	-----	-----	18.00
155 PTO H.P. 4 W.D.	hour	-----	-----	22.00
180 PTO H.P. 4 W.D.	hour	-----	-----	28.00
225 PTO H.P. 4 W.D.	hour	-----	-----	34.00

a/ Adapted from Computation of Costs of Performing Farm Operations, Pricing and Valuing Farm Input Handbook - Section 4 - No. 3. Assumes $8.25 per hour labor rates, $.90 diesel fuel costs, and machinery and power costs for new equipment estimated by procedure described in Table A.

The estimated costs of using machines and changes in custom rate index are starting points for establishing a custom rate for a particular situation. The supply and demand of machinery and adverse field and weather conditions alter the appropriate custom rate from case to case.

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October 1986

86-15/Looking Ahead to Farm Programs for 1987-1990

The Food Security Act of 1985 sets the course of commodity programs through 1990. Many parts of the programs for 1987 will be similar to those found in programs for 1986. But with lower loan rates, lower market prices, and substantial deficiency payments, most farm operators have very little choice about participating in these programs. The participants will be entitled to substantial benefits; nonparticipants, especially grain producers, will face almost certain losses. The key elements to watch are loan rates, target prices, and acreage reduction.

LOAN RATES AND TARGET PRICES

The 1985 Act established the basic loan rates for corn, soybeans, and wheat but gave the Secretary of Agriculture discretionary authority to reduce the loan rate further if the supply was above certain limits. The goal was to reestablish the competitive position of the United States in the world market. But the drop in the basic loan rate was limited to 5 percent per year.

The target prices for feed grains and wheat in 1986 and 1987 were frozen to remain the same as in 1985. Starting in 1988, a gradual reduction will begin as shown in the accompanying table. As a result of the freeze on target prices, deficiency payments from the 1986 and 1987 crops will be substantial because loan rates and market prices are lower.

ACREAGE REDUCTION

The 1985 Act continues the authority to require acreage reductions, set-aside, or paid land diversion to qualify for price support benefits.

For the feed grain program, the maximum acreage reduction from 1987 through 1990 is 12 1/2 percent if the carryover stocks are 2 billion bushels or less and 20 percent if carryover stocks are greater than 2 billion bushels. The Secretary has announced a 20 percent acreage reduction for the 1987 feed grain program. For wheat, the maximum acreage reduction for 1987 is 20 percent if the carryover is less than a billion bushels and 27 1/2 percent if the carryover is greater than a billion bushels. The Secretary has announced a 27 1/2 percent acreage reduction program for 1987. For 1988 through 1990, the maximum acreage reduction is 30 percent when the carryover stocks exceed a billion bushels.

inimum Target Prices and Loan Rates for Corn, Soybeans, and Wheat, 1987-1990

	1986	1987	1988	1989	1990
ORN					
arget price	$3.03	3.03	2.97	2.88	2.75
asic loan rate	2.40	2.28[a]	2.17[a]	2.06[a]	1.96[a]
nnounced loan rate	1.92[b]	1.82[c]	...	...	...
djusted loan rate	1.84	d	...	...	...
HEAT					
arget price	4.38	4.38	4.29	4.16	4.00
asic loan rate	3.00	2.85[a]	2.71[a]	2.57[a]	2.44[a]
nnounced loan rate	2.40[b]	2.28[b]	...	...	...
djusted loan rate	2.30	d	...	...	...
OYBEANS					
Basic loan rate	5.02	5.02	e	e	e
inimum discretionary	4.77	4.77	4.50	4.50	4.50
nnounced loan rate	4.77	...	...	...	...

[a]Projected minimum basic loan rate. The rate established by law is to be from 75 to 85 percent of the five-year average market price, dropping the high and low years, but not less than 5 percent below the rate for the previous year.
[b]The actual loan rate announced by the Secretary after having used his discretionary authority to reduce the loan rate up to 20 percent.
[c]The loan rate expected to be announced by the Secretary.
[d]Not yet announced at the time of writing.
[e]To be based on 75 percent of the simple five-year average market price, excluding the high and low years.

Acreage reduction or set-aside programs for wheat must be announced by June 1 the year before the crop is harvested; for feed grains the deadline is September 30. Adjustments may be made until July 31 for wheat and until November 15 for feed grains. Further announcements on the 1987 feed grains program therefore can be expected by November 15.

CONSERVATION

The 1985 Act made some major changes in conservation policies. The three major features affecting farming operations and management decisions are:

1. For highly erodible land on which crops were grown from 1981 to 1985, approved conservation plans must be approved by 1990 and in full compliance by 1995 so that the operator can qualify for farm program benefits. For all other highly erodible land, conservation plans must be approved by 1987. This feature is often referred to as the sodbuster provision.

2. Under the wetlands conservation provision, also called the swampbuster provision, program benefits are denied to producers who convert wetlands to cropland after December 23, 1985.

3. The Conservation Reserve was established in order to retire between 40 and 45 million acres of cropland for 10 years by 1990. In 1986 contracts were accepted on about 3.8 million acres, which are about 1.2 million acres short of the goal. Opportunities for signing contracts beginning in 1987 will be offered either this fall or next spring.

If acreage contracted falls below the established targets, some changes may be made in the length of contracts, specifications for highly erodible land, or payments. The amount of retired cropland could influence crop acreage and the oversupply of wheat and feed grains.

OPTIONAL PROGRAM FEATURES

The 1985 Act is complicated by the fact that many of its features permit discretionary action by the Secretary. The most significant options discussed, even if never implemented include:

The marketing loan. Under this program, farmers sell their commodities on the market and pay off their government loans at the world market price or at 70 percent of the basic loan rate, whichever is higher. Although there is political pressure to use the marketing loan, the Secretary of Agriculture has resisted efforts to expand this program to corn, wheat, or soybeans. The marketing loan is being used for rice and cotton. Those favoring the marketing loan claim it would make U.S. commodities more competitive in the world market; those opposing it point out the high cost to the federal government.

Loan deficiency payments. If producers who are eligible agree to forego taking out a commodity loan, the Secretary may offer a loan deficiency payment. Sometimes called a producer option payment (POP), the objective of such a payment would be to prevent the government from having to take over commodities that it would acquire if the market price did not exceed the loan rate plus interest.

Disaster payments. Although the 1985 Act does not automatically entitle producers to disaster payments if they can obtain crop insurance, the Secretary may make disaster payments to producers when certain emergency conditions have been met.

Cross compliance. The Secretary may require that when an acreage reduction program is in effect the acreage planted for any other program crop may not exceed the acreage base for that crop. Cross compliance was not in effect in 1986. Limited cross compliance has been announced for 1987 wheat, feed grains, cotton, and rice crops.

Acreage bases and yields. The effort to provide equity and fairness in setting bases and yields has created considerable confusion and uncertainty. Although certain rules are established in the law, the Secretary also has some discretion in setting bases and program yields.

The 1985 Act provided that payment yields of farm programs for 1986 and 1987 were to be calculated as the average program yield on the farm during the preceding 5

crop years (1981-1985), excluding the highest and lowest yields. Under the amendents passed in 1986, if the farm program yield for the 1986 crop was reduced more nan 3 percent from the 1985 yield, the Secretary had to make up the difference to ithin 3 percent in commodities owned by the Commodity Credit Corporation (CCC). or 1987, if the program yield declines more than 5 percent from 1985, then the ecretary must also make up the difference to within 5 percent in CCC-owned ommodities.

lthough the law provided authority for farmers to adjust the base acreage of any rop by up to 10 percent with a corresponding downward adjustment in the base acrege of another crop on the farm, this option will not be permitted in 1987.

dvance Payments. Required in 1986, advanced deficiency payments are at the disretion of the Secretary for crops from 1987 to 1990. Advance recourse commodity oans may also be made to producers for commodities with nonrecourse loan programs, ut such payments are not expected in 1987.

nterest payment certificates. The Secretary may issue commodity certificates to roducers who repay their loans with interest. The value of the certificates would e equal to the interest paid.

ayments in kind (PIK). PIK payments are authorized under the wheat, feed grains, otton, rice, and peanut titles of the Act.

aid land diversion (PLD). The Secretary has the discretion to offer a paid land iversion program. It can be offered whether or not an acreage reduction or setside program is in effect. Although not mentioned in the first announcement of he 1987 feed grain program, some believe that a paid land diversion will be added ater.

se of conservation acres. Production of alternate crops on the Acreage Conservaion Reserve will not be permitted in 1987. Grazing will be permitted at the equest of state committees of the Agricultural Stabilization and Conservation ervice (ASCS), except during any five-month period designated by the committees.

0/92 program provisions. This provision provides that producers who plant at east 50 percent of their permitted acreage to the program crop and devote the emaining permitted acreage to a conserving use will be eligible for deficiency ayments on 92 percent of the permitted acreage. Under this provision, haying and razing of land designated to be used for conservation will be permitted at the equest of the state ASCS committees. But the production of nonprogram crops on hese acreages will not be permitted in 1987.

HAT ABOUT A NEW FARM BILL IN 1987?

lthough the 1985 Food Security Act has been in effect for only about nine months, ressures are mounting to rewrite the Act in 1987:

The farm economy has not recovered, and many farmers are still in financial distress.

The cost of the Act in 1986 will total from $30 to $35 billion at a time of huge federal deficits.

- Some very large benefits are going to very large farming operations, whereas some middle-sized and smaller farming operations are being forced out of business.

- Huge surpluses of wheat and feed grains continue to be a major problem despite acreage reduction programs.

- Exports declined in 1986 despite lower market prices and a subsidized program to enhance exports.

Several bills have been introduced in Congress to rewrite or revise the 1985 Food Security Act. The most significant are those that would require a marketing loan for wheat and feed grains and higher price supports with a mandatory acreage control program if approved in a farmer referendum. No final action on these bills is expected in 1986.

When a new Congress convenes in January, more new bills can be expected. Efforts to raise supports and set up mandatory acreage controls will probably get further attention. Other bills will probably include attempts to limit extremely large payments, to target payments to operators of smaller and medium-sized farms, and to increase measures that will enhance exports.

Several factors will determine how successful any efforts to revise the 1985 legislation will be. These factors include farm prices, incomes, exports, the willingness of the Administration to change current policies, the party in control of the Senate, and the readiness of Congress to make any significant changes in current farm legislation.

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FARM ECONOMICS
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86-16/Projected Financial Situations of Midwest Cash-Grain Farms

Low commodity prices, weak land values, and large surpluses of grains have raised questions about the ability of farm operators to prosper and survive in agriculture. Although the future cannot be predicted with certainty, it is useful to examine projected financial situations under a set of commodity prices, production costs, and government farm programs that now seem likely. Such information can help farmers and their lenders make tough decisions about the future of agriculture. In this article, therefore, we project the future financial situations of Midwest cash-grain farms under different economic conditions.

The Food Security Act of 1985 provides cash-grain farms with price supports through a set of target prices, set-aside acreage diversion payments, and commodity loans. In anticipation of increased domestic grain surpluses, the U. S. Department of Agriculture announced a mandatory 20 percent acreage diversion for participation in 1987 programs. Farmers also have the option to idle an additional 15 percent of their land in return for diversion payments of $2.00 a bushel on grain that normally would have been grown on that acreage. In our projections, we predict the effects of program participation, tenure pattern, and amount of leverage on the financial situations of cash-grain farms. The effects of superior management skills are also considered.

THE PROJECTED ECONOMIC SITUATION OF CASH-GRAIN FARMS

To examine the effect of participation in farm programs, tenure pattern, and level of debt, the financial situation of a cash-grain farm is projected from 1987 to 1990 under three tenure patterns--full owner, part owner, and full tenant--and three initial debt-to-asset levels--0.20, 0.50, and 0.70--both with and without participation in the farm program. Assumptions about the size of farms and production costs are based upon grain farms in northern and central Illinois whose operators are in the Farm Business Farm Management Association (FBFM).

The base farm used in the simulation consists of 629 acres. Under all scenarios, the cropping pattern consists of 55 percent corn and 45 percent soybeans. The full owner is assumed to own all of the land; the part owner owns 119 acres and share-rents the remaining 510 acres on a 50-50 basis; the full tenant share-rents the entire 629 acres on a 50-50 basis.

Production costs and land values are assumed to remain constant over the four-year period of these projections. Production costs are based upon 1985 levels as

eflected by averages of the FBFM. Interest rates on current, intermediate, and ong-term debt are assumed to be constant at 11 percent. Commodity yields are lso assumed to be constant over the four-year period at 141 bushels per acre for orn and 44 bushels per acre for soybeans. Commodity prices for corn and soyeans are averages that are based on estimates from the Food and Agricultural olicy Research Institute (FAPRI) and Chase Econometrics. These prices are sumarized in Table 1.

Table 1. Commodity Prices used to Project the Financial Situations of Midwest Cash-Grain Farms

Commodity	Year			
	1987	1988	1989	1990
	-------dollars per bushel-------			
Corn	1.90	1.86	1.95	2.10
Soybeans	4.89	4.83	5.04	5.41

or the scenarios that include participation in farm programs, 35 percent of the ase corn acreage is diverted. The deficiency payment rate each year is assumed o equal the target price for corn, $3.03 a bushel, minus the expected price in able 1. A diversion payment of $2.00 a bushel is included for 15 percent of the ase corn acreage. Base yields provided by the Agricultural Stabilization and onservation Service are assumed to equal produced yields.

ash-Grain Farms With an Initial Debt-to-Asset Ratio of *Twenty* Percent

esults from the simulations of farm operations with an initial debt-to-asset atio of 20 percent are summarized in Table 2. For the scenario with no program articipation, net farm income is positive but weak except in the last year, when ommodity prices are highest. Net worth and the leverage position of the full wner and full tenant decline modestly over the four-year period, but the net orth and leverage position of the full tenant decline more sharply.

or the scenario with participation in the farm program, the net farm income nder all three tenure patterns is strong and increases each year. Net worth lso increases for all tenure patterns, and both full and part owners improve heir leverage positions.

he results of the simulations of farm operations with initial debt-to-asset atios of 20 percent suggest that survival is possible for an extended period of ime under relatively low commodity prices even without participation in a govrnment program. But program participation improves the financial situations of hese operations as measured by the debt-to-asset ratio.

ash-Grain Farms With an Initial Debt-to-Asset Ratio of *Fifty* Percent

esults from the simulations of farm operations with an initial debt-to-asset atio of 50 percent are summarized in Table 3. Under the scenario without

Table 2. Projected Financial Situations of Midwest Cash-Grain Farms with an Initial Debt-to-Asset Ratio of Twenty Percent

Scenario	Tenure pattern		
	Full owner	Part owner	Full tenant
NO PROGRAM:			
Net farm income			
1987	$ 4,731	$ 8,305	$ 7,791
1988	1,855	6,917	6,601
1989	10,083	12,745	11,748
1990	22,200	20,236	16,904
Net worth			
1987	$1,011,236	$306,735	$141,012
1988	996,252	295,761	129,880
1989	990,663	292,085	125,254
1990	995,974	294,985	125,022
Ending debt-to-asset ratio	0.20	0.21	0.30
WITH PROGRAM:			
Net farm income			
1987	$ 39,029	$ 28,666	$ 24,939
1988	40,932	30,443	26,611
1989	46,189	32,655	28,052
1990	52,209	34,825	29,173
Net worth			
1987	$1,045,534	$327,096	$158,160
1988	1,056,197	332,133	160,953
1989	1,074,371	341,803	167,681
1990	1,093,992	350,746	173,215
Ending debt-to-asset ratio	0.15	0.18	0.23

participation in the government farm program, net farm income is negative for the full owner and part owner in most years and very small or negative for the full tenant. A decline in net worth and leverage position occurs for each of the tenure patterns because net farm income is insufficient to cover the living expenses of the family.

With participation in the farm program, the net farm income of the full owner is still negative in most years, but net worth declines much less rapidly. Although the financial condition of the full owner is not improving, participation in the farm program clearly slows the decline in the financial condition of this operator. The part owner and full tenant generate positive, increasing net farm incomes by participating in the farm program. Government benefits allow the part owner and full tenant to increase their net worth and improve their leverage positions. The results of the simulations of farm operations with initial debt-to-asset ratios of 50 percent suggest that participating in the farm program is essential to their continued economic success.

Table 3. Projected Financial Situations of Midwest Cash-Grain Farms with an Initial Debt-to-Asset Ratio of Fifty Percent

Scenario	Tenure pattern		
	Full owner	Part owner	Full tenant
NO PROGRAM:			
Net farm income			
1987	($37,458)	($4,676)	$ 1,624
1988	(44,976)	(7,492)	(244)
1989	(41,728)	(2,962)	4,344
1990	(35,267)	2,927	9,899
Net worth			
1987	$585,503	$175,739	$ 78,782
1988	525,248	152,967	62,568
1989	468,241	134,726	51,521
1990	417,695	122,330	45,380
Ending debt-to-asset ratio	0.66	0.66	0.69
WITH PROGRAM:			
Net farm income			
1987	($3,160)	$ 15,685	$ 18,772
1988	(4,954)	16,266	19,766
1989	(1,699)	20,255	23,763
1990	1,848	24,076	26,632
Net worth			
1987	$619,801	$196,100	$ 95,930
1988	599,529	192,105	94,299
1989	582,551	194,556	99,299
1990	569,044	197,008	102,581
Ending debt-to-asset ratio	0.54	0.44	0.41

Cash-Grain Farms With an Initial Debt-to-Asset Ratio of *Seventy* Percent

Results from the simulations of farm operations with an initial debt-to-asset ratio of 70 percent are summarized in table 4. Under the scenario without participation in the farm program, the large interest expense associated with these operations cause negative net farm incomes under all three tenure patterns. The increased borrowing needed to cover operating costs and the living expenses of the family are so great that the full tenant is insolvent by 1990, and the full and part owners will probably be insolvent the following year.

Program participation is not enough to slow significantly the decline in net worth of the full or part owner. The net farm income of the full owners is negative and decreases with participation in the farm program. Only for the full

tenant are government benefits sufficient to maintain or improve the initial leverage position.

Table 4. Projected Financial Situations of Midwest Cash-Grain Farms with an Initial Debt-to-Asset Ratio of Seventy Percent

Scenario	Tenure pattern		
	Full owner	Part owner	Full tenant
NO PROGRAM:			
Net farm income			
1987	($ 65,585)	($ 13,331)	($ 2,487)
1988	(76,196)	(17,099)	(4,808)
1989	(76,382)	(13,626)	(652)
1990	(73,733)	(8,909)	4,366
Net worth			
1987	$301,680	$ 88,407	$ 37,296
1988	210,205	56,029	17,153
1989	118,544	27,124	1,222
1990	29,532	2,936	(9,793)
Ending debt-to-asset ratio	0.98	0.99	1.07
WITH PROGRAM:			
Net farm income			
1987	($ 31,287)	$ 7,030	$ 14,661
1988	(36,174)	6,660	15,202
1989	(36,349)	9,895	18,861
1990	(36,614)	12,733	22,104
Net worth			
1987	$335,978	$108,768	$ 54,444
1988	284,525	97,926	49,729
1989	232,897	91,438	50,943
1990	181,004	87,310	52,170
Ending debt-to-asset ratio	0.85	0.75	0.65

EFFECTS OF SUPERIOR MANAGEMENT ON CASH-GRAIN FARMS

Individual farmers have little control over the nature of government programs or the level of commodity prices. Nevertheless, through superior management they can achieve higher prices, better yields, and lower production costs.

To examine the effects of superior management skills on the financial situations of cash-grain farms, commodity prices and yields are increased, and input costs are decreased slightly for farm operators participating in the government program. Researchers at the University of Illinois ranked a sample of 179 Illinois cash-grain farms by management returns per acre (Sonka, S.T., R.H. Hornbaker, and

M.A. Hudson. "Managerial Performance and Income Variability for a Sample of Illinois Cash-Grain Producers." Selected Paper, Annual Meeting of the American Association of Agricultural Economists, Reno, Nevada, August 1986). This sample showed that the top one-eighth of these producers increased corn yields by one percent and soybean yields by five percent, and they increased prices received for corn by four percent and for soybeans by two percent. They also decreased operating expenses by 8.5 percent. Based upon these findings, Table 5 compares previous simulation results for average management with the results obtained by operators exhibiting superior management skills under the same three tenure patterns--full owner, part owner, and full tenant--and two initial debt-to-asset ratios (0.50 and 0.70). Participation in the government program is assumed for all operations.

Initial Debt-to-Asset Ratio of Fifty Percent

Results of the simulations of farm operations with an initial debt-to-asset ratio of 50 percent in Table 5 show that net farm income is positive under all three tenure patterns with superior management. The part owner and full tenant are able to increase net worth more with superior management than with average management. The full owner still experiences a decline in net worth with superior management because, even though net farm income is positive, it is not enough to cover the living expenses of the family. But the full owner is able to maintain the initial debt-to-asset ratio of 50 percent with superior management skills. Under each tenure pattern, ending leverage positions are reduced with superior management compared to average management, and the part owner and full tenant are able to reduce their debt-to-asset ratios significantly from the initial level of 50 percent.

Initial Debt-to-Asset Ratio of Seventy Percent

Results of the simulations of farm operations with an initial debt-to-asset ratio of 70 percent in Table 5 show that net farm income is positive and increases for both the part owner and full tenant. Participation in the government program and superior management skills are not enough to stop the decline in net worth or increase in leverage for the full owner. But the part owner is able to decrease significantly the rate at which net worth declines and can reduce leverage slightly with superior management skills. The full tenant is able to increase net worth and decrease significantly the ending leverage position with superior management.

Simulation results presented here suggest that participating in government programs and management skills have a strong bearing on the ability of cash-grain farms to survive and prosper under relatively low commodity prices. In all but one case, a combination of participation in the government farm program and superior management skills enables the simulated farms to survive for an extended period of time regardless of tenure pattern or initial debt-to-asset ratio. Farm operators may also affect their tenure patterns and leverage positions through sales or purchases of capital and land.

Table 5. Projected Financial Situations of Midwest Cash-Grain Farms with Average and Superior Management Skills with Participation in the Government Farm Program

	Management skills					
	Full owner		Part owner		Full tenant	
	Average	Superior	Average	Superior	Average	Superior
Initial 0.50 debt-to-asset ratio						
Net farm income						
1987	($ 3,160)	$ 9,374	$ 15,685	$ 23,204	$ 18,772	$ 25,042
1988	(4,954)	8,597	16,266	24,397	19,766	26,544
1989	(1,699)	13,481	20,255	29,237	23,763	31,194
1990	1,848	18,918	24,076	33,961	26,632	33,137
Net worth						
1987	$619,801	$632,335	$196,100	$203,619	$ 95,930	$102,200
1988	599,529	622,711	192,105	204,889	94,299	104,885
1989	582,551	619,523	194,556	213,524	99,299	114,581
1990	569,044	620,600	197,008	221,835	102,581	121,194
Ending debt-to-asset ratio	0.54	0.50	0.44	0.37	0.41	0.37
Initial 0.70 debt-to-asset ratio						
Net farm income						
1987	($ 31,287)	($ 18,753)	$ 7,030	$ 14,549	$ 14,661	$ 20,931
1988	(36,174)	(22,624)	6,660	14,791	15,202	21,980
1989	(36,349)	(20,850)	9,895	18,931	18,861	26,360
1990	(36,614)	(19,036)	12,733	22,853	22,104	30,396
Net worth						
1987	$335,978	$348,512	$108,768	$116,287	$ 54,444	$ 60,714
1988	284,525	310,609	97,926	111,198	49,729	60,471
1989	232,897	274,480	91,438	112,543	50,943	67,191
1990	181,004	240,165	87,310	114,568	52,170	73,168
Ending debt-to-asset ratio	0.85	0.81	0.75	0.68	0.65	0.51

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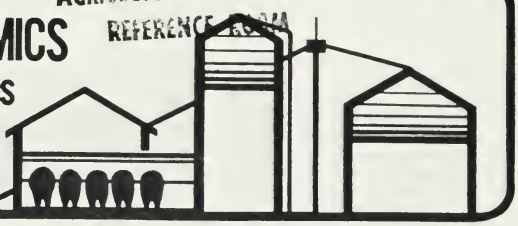

November 1986

86-17/1987 Farmland Assessments, the Farm Tax Base and Recent Assessment Legislation

Legislation signed into law in August, 1986, has frozen farmland assessment certified values for 1987. Several counties have faced declining farm assessments and administrative difficulties as assessing officers have begun implementing use-value assessments for the first time. The attention of the General Assembly was again focused on the property tax assessment of farmland. In 1984 the 10 percent "limit law" was enacted to insulate local tax bases somewhat from the poor performance of the farm economy. This law slowed the decline in farmland assessments by restricting the change in farmland assessments in any county to 10 percent from one year to the next. The limit, which was on the total farmland assessments in a county, provoked administrative challenges and subsequent legislative actions in 1986. The 1986 legislation, among other things, freezes farmland assessment certified values in 1987 at the 1986 level.

Because of the economic decline in agriculture, the assessed value of Illinois farm real estate has been dropping since 1981. Between 1981 and 1984 farm assessment declined 15.3 percent. But taxes paid by the owners of farm real estate from 1982 through 1985 (based on assessments from 1981 through 1984) declined only 4.7 percent from $446.0 million to $424.9 million. The discrepancy arose as rural schools, townships, counties, and other rural governments countered the poor performance of the rural tax base with tax rate increases in an attempt to maintain tax receipts and services. Higher property tax rates will be required in the future if current spending by rural governments and school districts on local public services is to be maintained without fundamental changes in the tax and spending systems supporting them.

The 1984 "limit law" and the 1986 farmland assessment amendment merely retard the rate of adjustment in farm assessments and the tax bases of rural governments. They mask the implications of the fundamental economic changes in farming for the adequate and equitable financing of rural governments and schools. The poor performance of Illinois's farm economy will continue to depress farm property tax bases and the fiscal health of its rural local governments and schools well into the 1990s.

THE 1986 FARMLAND ASSESSMENT LEGISLATION

The farmland assessment legislation passed in 1986 recognized the limited protection offered many rural governments by the county-wide 10 percent limit in the 1984 statute. It also recognized that use-value farmland assessments must be implemented in all counties if farmland is to be assessed uniformly throughout Illinois. The legislation included state financial assistance for rural schools that have been severely affected by the declining farm tax base. The state will provide transitional assistance for the 1987 budget year. Specifically, the 1986 farmland assessment legislation will result in:

1. The 10 percent limit on changes in aggregate county-wide farmland assessments being imposed only for 1984 and 1985.

2. Farmland assessments in 1986 and 1987 based on 1986 certified assessed values. If 1986 assessments on farms are correctly determined using the 1986 certified values, 1987 assessments will be the same as in 1986.

3. A limit on the change in these certified assessed values from year to year to 10 percent beginning in 1988. This will insulate the tax base of all rural governments to the same degree and effectively limit the change in assessments on individual farms to 10 percent.

4. Partial protection of 1987 revenues of rural school districts from losses if 1986 total assessments decline more than 10 percent because of drops in farmland assessments. The state will pay districts for taxes not received in 1987 because of decreases in total assessments in 1986 in excess of 10 percent.

Because of sparse information, it is difficult to identify the implications of the changes in farmland assessments for the tax bills of individual farmers and the tax bases of schools and other taxing districts. Data are only available at the county level. The lack of other data hides the substantial variation within counties, among farms, and among rural governments and schools.

PER-ACRE AVERAGE FARNLAND ASSESSMENTS: 1984 THROUGH 1988

Average farmland assessments for Illinois counties are presented in Table 1. The 1984 and 1985 assessments are actual assessments, whereas the 1986, 1987, and 1988 assessments are estimates. The variation in 1984 and 1985 per-acre assessments among counties reflects differences in the quality of land, past assessment practices, and the county-wide 10 percent limit under the "limit law." For the most part, changes in farmland assessments between 1984 and 1985 reflect the 10 percent limit. The estimated per-acre average assessments for 1986 are based on the 1986 certified values. Under the 1986 amendment, these values are also the basis for 1987 farm assessments. Thus, 1986 and 1987 estimated averages are identical, and 1988 averages are 90 percent of the 1987 averages based on the assumption that the change in 1988 certified values will be limited to 10 percent as prescribed in the 1986 amendment.

The change in assessments between 1985 and 1986 will reflect the transition to certified values in all counties. The percentage of change in per-acre assessments is also presented in Table 1 for all counties. A number of counties have no change or a small increase in average assessments between 1985 and 1986, whereas other counties are expected to experience up to a 50 percent decline in farm assessments. The small increase in average assessments in some counties reflects the slight increase in the 1986 certified values particularly for the more productive soils.

Table 1. County Average Farmland Assessments

County	1984	1985	1986[a]	1987[a]	1988[a]	Percentage of change 1984-85	Percentage of change 1985-86[a]
	. . . . . dollars per acre						
Adams	146	131	126	126	113	-10.3	- 3.8
Alexander	55	49	24	24	22	-10.9	-51.0
Bond	91	82	82	82	74	- 9.9	0.0
Boone	235	211	202	202	182	-10.2	- 4.3
Brown	105	90	84	84	76	-14.3	- 6.7
Bureau	231	208	184	184	166	-10.0	-11.5
Calhoun	85	75	59	59	53	-11.8	-21.3
Carroll	213	192	157	157	141	- 9.9	-18.2
Cass	154	139	126	126	113	- 9.7	- 9.4
Champaign	340	315	325	325	293	- 7.4	3.2
Christian	275	248	255	255	230	- 9.8	3.0
Clark	100	89	71	71	64	-11.0	-20.2
Clay	89	81	65	65	59	- 9.0	-19.8
Clinton	94	84	73	73	66	-10.6	-13.1
Coles	282	263	252	252	227	- 6.7	- 4.1
Cook	-	-	-	-	-	-	-
Crawford	109	97	68	68	62	-11.0	-29.9
Cumberland	119	107	107	107	96	-10.1	0.0
DeKalb	315	290	302	302	272	- 7.9	4.1
DeWitt	366	326	326	326	293	-10.9	0.0
Douglas	352	333	346	346	311	- 5.4	3.9
DuPage	236	223	200	200	180	- 5.5	-10.3
Edgar	275	247	253	253	228	-10.2	2.4
Edwards	132	119	74	74	67	- 9.8	-37.8
Effingham	110	98	62	62	56	-10.9	-37.7
Fayette	92	82	82	82	74	-10.9	0.0
Ford	239	215	203	203	183	-10.0	- 5.6
Franklin	85[a]	76	48	48	43	-10.6	-36.8
Fulton	136	122	95	95	86	-10.3	-22.1
Gallatin	139	126	126	126	113	- 9.4	0.0
Greene	175	160	166	166	149	- 8.6	3.8
Grundy	240	216	215	215	194	-10.0	- 0.4
Hamilton	80	72	57	57	51	-10.0	-20.8
Hancock	183	166	170	170	153	- 9.3	2.4
Hardin	48[a]	43[a]	31	31	28	-10.0	-27.9
Henderson	188	170	174	174	157	- 9.6	2.4
Henry	207	187	191	191	172	- 9.7	2.1
Iroquois	239	215	178	178	160	-10.0	-17.3
Jackson	68	61	35	35	32	-10.3	-42.6
Jasper	127	115	76	76	68	- 9.5	-33.9
Jefferson	107	99	46	46	41	- 7.5	-53.5
Jersey	139	125	110	110	99	-10.1	-12.0
JoDaviess	91	89	90	90	81	- 2.2	1.1
Johnson	59	53	41	41	37	-10.2	-22.6

ble 1. Continued

unty	1984	1985	1986[a]	1987[a]	1988[a]	Percentage of change 1984-85	Percentage of change 1985-86[a]
	. . . . . *dollars per acre*						
ine	242	222	218	218	196	- 8.3	- 1.8
nkakee	199	180	163	163	147	- 9.5	- 9.4
ndall	280	254	262	262	239	- 9.3	3.2
ox	251	226	216	216	194	-10.0	- 4.4
ke	143	128	95	95	86	-10.5	-25.8
Salle	267	239	248	248	223	-10.5	3.8
awrence	106	106	111	111	100	0.0	4.7
ee	262	235	210	210	189	-10.3	-10.6
ivingston	246	221	212	212	191	-10.2	- 4.1
ogan	298	270	279	279	251	- 9.4	3.3
cDonough	238	215	210	210	189	- 9.7	- 2.3
cHenry	220	198	181	181	163	-10.0	- 8.6
cLean	321	296	305	305	275	- 7.8	3.0
acon	386	338	345	345	311	-14.2	2.1
acoupin	168	147	129	129	116	-12.5	-12.2
adison	205	183	146	146	131	-10.7	-20.2
arion	86	77	52	52	47	-10.5	-32.5
arshall	251	226	235	235	212	-10.0	4.0
ason	158	137	109	109	98	-13.3	-20.4
assac	104	94	55	55	50	- 9.6	-41.5
enard	270	243	246	246	221	-10.0	1.2
ercer	200	180	184	184	166	-10.0	2.2
onroe	121	111	81	81	73	- 8.3	-27.0
ontgomery	162	145	148	148	133	-10.5	2.1
organ	233	233	233	233	210	0.0	0.0
oultrie	358	339	340	340	306	5.3	0.0
Ogle	230	207	201	201	181	-10.0	- 2.9
Peoria	196	167	164	164	148	-14.8	- 1.8
Perry	85	76	48	48	43	-10.6	-36.8
Piatt	347	341	348	348	313	- 1.7	2.1
Pike	163	145	149	149	143	-11.0	2.8
Pope	53	47	42	42	38	-11.3	-10.6
Pulaski	86	78	64	64	58	- 9.3	-17.9
Putnam	205	186	186	186	167	- 9.3	0.0
Randolph	118	107	71	71	64	- 9.3	-33.6
Richland	88	81	61	61	55	- 8.0	-24.7
Rock Island	196	177	177	177	159	- 9.7	0.0
St. Clair	124	116	117	117	105	- 6.5	0.8
Saline	97	87	62	62	56	-10.3	-28.7
Sangamon	313	289	299	299	269	- 7.7	3.4
Schuyler	109	98	80	80	72	-10.1	-18.4
Scott	159	143	117	117	105	-10.1	-18.2
Shelby	161	145	123	123	111	- 9.9	-15.1
Stark	247	222	230	230	207	-10.1	3.6
Stephenson	162	153	158	158	142	- 5.6	3.2

Table 1. Continued

County	1984	1985	1986[a]	1987[a]	1988[a]	Percentage of change 1984-85	Percentage of change 1985-86[a]
	. . . . . *dollars per acre*						
Tazewell	265	238	243	243	219	-10.2	2.1
Union	94	85[a]	70	70	63	-10.0	-17.7
Vermilion	238	215	209	209	188	- 9.7	- 2.8
Wabash	135	122	118	118	106	- 9.6	- 3.3
Warren	321	296	306	306	275	- 7.8	3.4
Washington	85	77	59	59	53	- 9.4	-23.4
Wayne	110	99	73	73	66	-10.0	-26.2
White	133	120	107	107	96	- 9.8	-10.8
Whiteside	226	204	201	201	181	- 9.7	- 1.5
Will	196	177	161	161	145	- 9.7	- 9.0
Williamson	83	66	37	37	33	-20.5	-43.9
Winnebago	173	156	149	149	134	- 9.8	- 4.5
Woodford	311	287	297	297	267	- 7.7	3.5

[a]Indicates an estimate. The change for all counties between 1986 and 1987 is 0 percent; and between 1987 and 1988, it is -10 percent.

For counties with 1984 assessments based on certified values or where implementation of use-value assessments was complete before 1985 and where the county was not subject to the 10 percent limit law in 1985, the small increase in 1986 certified values increased average per-acre assessments. Other counties are expected to experience reduced rates of farm assessment declines.

Generally, the change in farmland assessments expected in 1986 will be smaller for counties having more uniform and higher-quality soil and past assessments that were based more closely on certified assessed values. For those same counties, the slightly higher 1986 certified assessed values are more likely to increase average assessments between 1985 and 1986.

Alternatively, counties with a wide range in soil quality and a higher proportion of noncropland in farms and counties that implemented use-value assessments for the first time in 1985 are expected to experience substantial drops in average per-acre assessments in 1986. These characteristics divide the counties geographically as shown in the map in Figure 1. All but one of the 23 counties expected to have 1986 farmland assessments reduced by over 20 percent are counties in southern Illinois. All but three of the 29 counties expected to have higher 1986 farmland assessments are in northern Illinois.

BALANCE IN THE ILLINOIS TAX SYSTEM AND AGRICULTURE

The economic troubles on Illinois farms are slowly and adversely affecting the tax capacity of rural schools and other local governments. The renascence of rural Illinois's economy in the years ahead will include major structural changes in the farm sector. The farm property tax capacity that is being lost will not be restored. As a result, some fundamental rethinking of the tax and spending system in Illinois is needed.

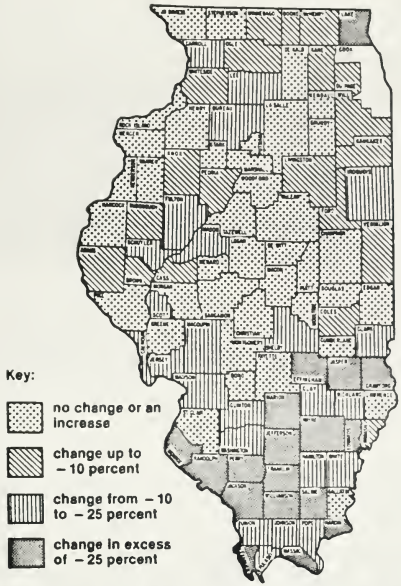

Figure 1. Change in per-acre farmland assessments, 1985-86.

Equity is important for tax systems. The perception of fairness is critical. The burden of the property tax on the farm sector, when compared to personal income from farming, has been historically high in comparison to other sectors and the state as a whole because of the importance of land in agricultural production. Historically, property taxes in Illinois have varied between 3 and 4 percent of personal income. For agriculture, the range has been between 12 and 18 percent.

During the 1980s, the property tax burden on Illinois agriculture has increased as farm incomes declined and farm property taxes remained relatively stable, despite declining assessments. For the period from 1980 to 1984, the average ratio of property tax payments to personal income for the nonfarm sectors in Illinois was 3.5 percent (3.7 percent for the state). For agriculture, the ratio is an astounding 36.1 percent--nearly two to three times the historical level of 12 to 18 percent.

The historical balance between the property taxes and personal income of farmers has been disrupted by the poor performance of the farm economy. Restoring this balance requires some difficult decisions about public finance and tax policy. One option is to replace some of the revenues from farm property taxes with other revenues in order to lower the property tax burden of the farm sector.

Presented in Table 2 are alternative levels of farm property tax burdens and estimates of the funds required to lower them. For example, $62 million are required to lower

Table 2. Balancing Farm Property Taxes

Farm property tax burden[a] percentage	Balancing funds, millions of dollars	Change in the rate of state personal income tax percentage	Required rate of state personal income tax percentage
10	304	+0.25	2.75
15	244	+ 0.20	2.70
20	183	+ 0.16	2.66
25	123	+ 0.10	2.60
30	62	+ 0.05	2.55

[a]Burden is defined as the percentage of personal income from farming represented by farm property taxes in Illinois. The farm property tax extensions has been taken from *Illinois Property Tax Statistics*, Illinois Department of Revenue, Springfield, Illinois (various years). The figure for the personal income from farming in Illinois have been obtained from the data on income and employment provided by the Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C.

the amount of farm income represented by property taxes to 30 percent from the current 36.1 percent. About $123 million of other revenues would be required to lower the farm property tax burden to 25 percent.

The "balancing funds" to lower farm property tax burdens could be raised through higher rates for state taxes or the reallocation of current state government funds. Higher state individual income tax rates are one option. The rate changes and the resulting individual income tax rates necessary to raise the monies to finance the balancing fund are also given in Table 2.

Increasing the state individual income tax to balance the property tax burden on agriculture would shift the tax burden from farmland property taxpayers to individual income taxpayers. For example, to finance the estimated $123 million necessary for reducing the property tax burden of agriculture to 25 percent (about seven times the burden of the nonfarm sector), the individual income tax rate would have to increase by .1 percent. This increase would raise the state individual income tax rate from 2.5 percent to 2.6 percent. Another option is to finance the "balancing fund" with the increased state tax revenues coming from economic growth. Of course, a third option is to take no action, but following this course would probably see the burden of the property tax on the farm sector approach 50 percent of personal income in the years ahead.

SUMMARY

Administrative problems combined with declining farm assessments brought the assessment of farmland to the attention of the Illinois General Assembly again in 1986. Legislation passed in 1986 will move farmland assessments in all counties toward uniformity and freeze certified values in 1987. Beginning in 1988 the change in the taxable value of individual farm parcels will be limited to 10 percent from one year to the next. In effect this limitation legislates the level of farmland assessments to

be independent of the economic conditions in Illinois agriculture. Farmland assessments will decline 10 percent annually for several years beginning in 1988 as assessments catch up to the faltering farm economy.

One result of low farm incomes and relatively stable taxes on farm property has been an increase in the property tax burden on Illinois agriculture when measured as a percentage of personal income. This burden has climbed to over 36 percent from historical levels of 12 to 18 percent. For the nonfarm sector this burden is 3.5 percent. Fairness is essential for all tax and spending systems. An evaluation of the fairness of the Illinois property tax on farmers may be needed.

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FARM ECONOMICS
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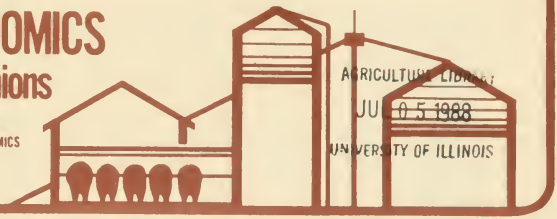

December 1986

86-18/Land Values: Factors Pushing the Market

A number of pervasive factors that influence land income and values are pulling in different directions. Most indicators show that land values are down about 15 percent from one year ago(based upon the Chicago Federal Reserve Bank and both a private survey and that of the author). Most of the better land in central and northern Illinois is selling in the range of $1,400 to $1,900 per acre. Some occasional sales occur outside that range. Expectations are for a further decline next year, averaging less than last year.

Interest Rates are lower and have been down long enough to cause mortgage interest rates to come down substantially. The short-term Treasury Bill and CD rates are affecting the availability of funds for land investment even more than the lower mortgage rates. With the CD rates at 5 to 5.5 percent and long-term treasury bonds at 7.5 percent, some investors feel that land is a good buy because it is returning on current account as much as are CD's. Investors also believe land prices are near their low, and if or when there is a resurgence of inflation, land prices will increase. The St. Louis Farm Credit System is making special 8 percent loans for 5 years on land which they have acquired and are selling. A private reporting service indicates this special financing is producing a higher average price on that land compared with other similar land sold for cash or on more normal financing terms. Therefore, the rate of interest does make a difference: other things being equal, lower interest rates raise values.

Exchange Rates and the Trade Deficit. The dollar has been devalued from 25 percent to as much as 40 percent, compared with the European currencies and the Japanese yen. Combining the change in exchange rates and the dollar price decline, land prices in terms of these foreign currencies are only one-fourth to one-third as much as they were in 1980.

The large continuing trade deficit is putting megabucks into the hands of foreigners. These dollars are coming back to the U.S. to buy different forms of capital--mostly government bonds and other commercial financial instruments but also factories (the auto factory in Bloomington, Illinois is an example), U.S. based companies (Howard Johnson's is owned by a British company), and real estate in the form of office buildings, apartment complexes, shopping centers and farmland. Up to now, foreign investment in farmland has been small, but with our trade deficit running at over 10 to 15 billion dollars per month, there are "megabucks abroad looking for something to purchase in the U.S." Three months of the trade deficit provides enough money to buy all the farmland in Illinois. This

author expects an increase in interest, demand, and purchase of Illinois farmland by foreign investors. All things being equal, the increased demand will cause farmland prices to rise. Some neighboring states have rules against foreign ownership; therefore, foreign money is more likely to be targeted at Illinois farmland, provided the midwest is on the foreign buyers' shopping list.

General Inflation or Deflation. Inflation, at least as we knew it a few years ago, is almost dead. The current rate is less than three percent. But what is the chance that inflation will be resurrected? Probably, fairly high. The $64,000 question is *when?* With both a federal deficit still running bigger than ever and the immense trade deficit, few economists seriously believe that low inflation rates can be maintained for very long. Again, other things being equal, inflation will increase farmland prices. Whether farmland ownership proves to be a good hedge against inflation, as it was from 1950 to 1980, depends upon how large a share of total GNP is garnered for agriculture. This might not happen next time around. Commodity prices and land prices could go up but at a slower rate than general inflation, making farmland prices nominally higher but less relative to other things.

Farm Income has been declining in real terms for several years, but net rent to land, except for year to year variation, has been almost level in current dollar terms since 1980. Net rents from the better land on crop share leases in central and northern Illinois have averaged $108, $93, $90, $102, $91, and $117 per acre, respectively, for the years 1980 through 1985. Since 1983, however, a larger and larger share of this rent has been produced through the use of Federal Farm Programs. This could increase the uncertainty of potential return to the free market should Congress, in its wisdom, retreat from appropriating ever larger government subsidies. A substantial part of the record 1985 rents came from record high yields as well as from government payments. A total return to the free market (which is probably not very likely in the near term) could conceivably cut rent in half. If this continued at a new, lower level for several years, and if investors were convinced that this situation represented the equilibrium, land prices would soon follow net rents down accordingly. So we continue to have rather depressing commodity prices in the market for midwestern agricultural goods. This is a serious drag on farmland prices resulting in, most likely, lower land prices.

Another factor developing in the market is the direct value effect on land due to the size of the corn base on a particular tract. Two identical tracts with a different corn base will have different values. Government programs totally distorted the tobacco land market, and a similar distortion of the corn land market is in the offing. This means a widening differential in income to farmers and to land rent between northern and southern Illinois because of the difference in crop history of the various areas within the state. Northern Illinois, with more livestock, has always grown more corn. Central Illinois has been about 50-50 between corn and soybeans, while southern Illinois has had less than half in corn. If the programs continue to subsidize corn, the land price differential between northern and southern Illinois will become even greater (the land price differential is already large because of basic productivity).

Other Reasons for Holding Farmland. There are, of course, many reasons why people own farmland, in addition to the level of current income generated. Other reasons include speculation about inflation in the general economy, speculation about location (where it could be used for other non-farm purposes), intrinsic value, emotional attachment, open space, territorial imperative, permanency, and many more. Thus, land value has never been as low as one would think, based purely on comparing value and income of land with value and income of most financial instruments (for example, commercial and government bonds). In other words, the current rate of return on land has always been less than the long-term government bond rate. This difference has varied over the years, depending on expectations

and non-agricultural income value. At the present time this difference is approaching, historically, a more normal relationship. Land prices could overshoot the equilibrium mark on the down side.

Summary. Currently, market prices on corn, wheat, and beans are much lower than many people expected. Even though incomes have held up well, income decline is likely over the coming year, due mainly to the lower price of soybeans. With a return to normal yields and persistent lower market prices, the downward pressure of income on land values is the most pervasive factor in the market. Lower commodity prices coupled with government program uncertainties are the overpowering factors pushing the market lower.

Another price depressant in the land market is the supply of land being held by lending agencies that must come into the market. Despite many price-increasing factors in the market, the general expectation is for a continuation of somewhat lower land prices in the coming year. There are instances of land sales at prices higher than expected, but there are usually special local circumstances affecting those sales. Any future annual declines are likely to be more modest by recent history (in the 5 to 10 percent range) but could be more, depending upon government programs, extent of foreclosures, and land selling actions of lending institutions.

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FARM ECONOMICS
Facts and Opinions

DEPARTMENT OF AGRICULTURAL ECONOMICS
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December 1986

86-19/The Projected Economic Situation of Midwest Livestock Farms

The financial situation of Midwest hog, feeder cattle, and dairy farms are projected from 1987 to 1990 with three initial debt-to-asset levels (20, 50, and 70 percent) and under three different price scenarios (weak, moderate, and strong). Assumptions about farm size and production costs are based upon northern and central Illinois hog, beef, and dairy farms in the Farm Business Farm Management Association (FBFM).

For all three livestock farms, production costs and land values are assumed to remain constant over the four-year projection period. Production costs are based upon 1985 levels as reflected by FBFM averages. Interest rates on current, intermediate, and long-term debt are assumed to be constant at 11 percent. An assumption of $8,700 of off-farm income is included in all simulations. Crop yields are assumed to be constant at 141 and 44 bushels per acre for corn and soybeans, respectively, and 18 and 5 tons per acre for corn silage and hay, respectively. Commodity prices for corn and soybeans are averages based on Food and Agricultural Policy Research Institute (FAPRI) and Chase Econometric estimates. The prices used in the moderate price scenarios for market hogs, market cattle, and milk are also averages of these estimates. Projected prices of all crops and livestock are summarized in Table 1.

HOG FARMS

The base hog farm consists of 348 acres, of which 66 acres are owned and 282 are rented on a 50-50 crop-share basis. Of this, 212 acres of corn and 136 acres of soybeans are raised. The farm operator is assumed to own all hog facilities and to farrow and finish 169 litters per year with an average of 7.68 pigs weaned per litter. The results of the hog farm simulations are presented in Table 2.

Weak Prices

In the weak price scenario, net worth declines regardless of the initial debt-to-asset ratio. Only the farm with an initial debt-to-asset ratio of 20 percent is able to realize positive net farm income over the four-year period. This small amount is insufficient to cover family living expenses; therefore, net worth still declines. The hog farm with an initial debt-to-asset ratio of 70 percent is insolvent by 1990 under the weak price scenario.

Table 1. Commodity Prices Used to Project the Financial Conditions of Midwest Livestock Farms

Commodity	Unit	Scenario	1987	1988	1989	1990
Corn	bu.	All	$ 1.90	$ 1.86	$ 1.95	$ 2.10
Soybeans	bu.	All	4.89	4.83	5.04	5.41
Silage	ton	All	15.00	15.00	15.00	15.00
Hay	ton	All	60.00	60.00	60.00	60.00
Cull sows	cwt.	All	35.70	34.50	35.50	34.20
Feed. steers	cwt.	All	64.75	67.20	68.45	66.10
Veal calves	cwt.	All	71.50	71.50	71.50	71.50
Cull cows	cwt.	All	37.00	37.00	37.00	37.00
		Weak	36.63	35.55	36.45	35.28
Mkt. hogs	cwt.	Moderate	40.70	39.50	40.50	39.20
		Strong	48.84	47.40	48.60	47.04
		Weak	55.13	57.33	58.46	56.34
Mkt. cattle	cwt.	Moderate	61.25	63.70	64.95	62.60
		Strong	67.38	70.07	71.45	68.86
		Weak	10.59	10.05	9.74	9.29
Milk	cwt.	Moderate	11.77	11.17	10.82	10.32
		Strong	12.95	12.29	11.90	11.35

Moderate Prices

In the moderate price scenario, net farm income is still low and only the farmer with an initial debt-to-asset ratio of 20 percent is able to increase net worth. For this farm, net farm income is still insufficient to cover family living expenses. The inclusion of off-farm income allows these expenses to be met and net worth to increase slightly. The farm with an initial debt-to-asset level of 50 percent will be able to survive for some time, but net farm income is weak and net worth is declining. The farm with an initial debt-to-asset ratio of 70 percent has lost over one-half of the initial net worth by 1990 with moderate prices. It is unlikely that this farm will survive much longer under these economic conditions.

Strong Prices

For the strong price scenario, net farm income is strong and positive; net worth increases regardless of the initial debt-to-asset ratio. The strong price scenario most closely reflects the prices being received by hog farmers in late fall of 1986 and depicts an optimistic outlook for hog farms if these economic conditions continue.

Table 2. Projected Financial Situations of Midwest Hog Farms

Scenario	Initial debt-to-asset ratio 0.20	0.50	0.70
WEAK PRICES			
Net farm income			
1987	$ 12,238	$ 149	($ 7,910)
1988	6,322	(5,994)	(14,939)
1989	6,994	(4,790)	(14,706)
1990	6,211	(5,367)	(16,374)
Net worth			
Initial	$293,060	$183,163	$109,898
1987	289,019	167,033	85,709
1988	277,239	145,638	55,491
1989	268,469	125,569	25,506
1990	259,557	104,923	(6,147)
Ending debt-to-asset	0.18	0.61	1.02
MODERATE PRICES			
Net farm income			
1987	$ 23,202	$ 11,113	$ 3,054
1988	16,962	5,852	(3,093)
1989	17,904	8,370	(1,328)
1990	16,770	8,841	(1,880)
Net worth			
Initial	$293,060	$183,163	$109,898
1987	299,983	177,997	96,673
1988	295,066	166,094	77,927
1989	296,612	158,744	61,279
1990	296,229	151,508	44,035
Ending debt-to-asset	0.16	0.43	0.83
STRONG PRICES			
Net farm income			
1987	$ 45,129	$ 33,040	$ 24,981
1988	38,243	29,545	20,600
1989	39,724	32,110	24,748
1990	37,889	31,095	26,075
Net worth			
Initial	$293,060	$183,163	$109,898
1987	321,910	199,924	118,600
1988	329,528	203,521	116,613
1989	346,309	214,134	123,418
1990	359,057	220,830	126,992
Ending debt-to-asset	0.14	0.34	0.54

FEEDER CATTLE FARMS

The base feeder cattle farm consists of 434 acres, of which 119 acres are owned and 315 acres are rented on a 50-50 crop-share basis. Of this, 260 acres of corn, 115 acres of soybeans, 31 acres of corn silage, and 28 acres of hay are raised. The farm operator is assumed to own all feeder cattle facilities and feeds out 304 head of cattle per year. The results of the feeder cattle farm simulations are presented in Table 3.

Weak Prices

For the weak price scenario, net farm income is negative and net worth declines throughout the four-year period regardless of the initial debt-to-asset level. The farmer with an initial debt-to-asset ratio of 70 percent is insolvent by the third year. Only the farm with an initial debt-to-asset ratio of 20 percent is able to survive for an extended period of time under these economic conditions.

Moderate Prices

In the moderate price scenario, net farm income is negative except for the farm with an initial debt-to-asset ratio of 20 percent. The net farm income of this farmer is still not enough to cover family living expenses; therefore, net worth declines, but not as rapidly as it does for farms with initial debt-to-asset ratios of 50 to 70 percent. Moderate prices are still not enough to allow the farm with an initial 70 percent debt-to-asset ratio to remain solvent over the entire four-year period.

Strong Prices

With strong prices, the feeder cattle farm with an initial debt-to-asset ratio of 20 percent is able to increase net worth and maintain a strong level of net farm income. The farm with an initial debt level equal to one-half of its assets is able to generate small positive net farm incomes in the last three years and slightly decrease the initial debt-to-asset ratio. Net worth still declines, however. Even with strong prices, it is unlikely that the farmer with an initial debt-to-asset level of 70 percent can continue to profitably feed cattle for an extended period of time. Under the economic conditions presented here, this farm has lost nearly one-half of its initial net worth at the end of the four-year period.

DAIRY FARMS

The base dairy farm consists of 280 acres, of which 100 acres are owned and 180 acres are rented on a 50-50 crop-share basis. Of this, 122 acres of corn, 80 acres of soybeans, 28 acres of corn silage, and 50 acres of hay are raised. As with the hog and feeder cattle farms, the farm operator is assumed to own all livestock facilities. The farmer is assumed to milk a herd of 55 cows with an annual milk production of 14,997 pounds per cow. Calves not kept for replacement heifers are sold at 200 pounds. The results of the dairy farm simulations are presented in Table 4.

Table 3. Projected Financial Situations of Midwest Feeder Cattle Farms

Scenario	Initial debt-to-asset ratio 0.20	0.50	0.70
WEAK PRICES			
Net farm income			
1987	($23,617)	($43,341)	($ 56,490)
1988	(19,500)	(41,393)	(55,988)
1989	(14,430)	(38,731)	(54,932)
1990	(7,862)	(34,836)	(52,819)
Net worth			
Initial	$478,147	$298,843	$179,305
1987	438,251	239,223	106,536
1988	403,472	182,551	35,269
1989	373,763	128,541	(34,942)
1990	350,622	78,426	(103,040)
Ending debt-to-asset	0.33	0.85	1.20
MODERATE PRICES			
Net farm income			
1987	($ 3,682)	($ 23,406)	($ 36,555)
1988	3,442	(18,451)	(33,047)
1989	11,423	(12,876)	(29,077)
1990	20,017	(6,886)	(24,869)
Net worth			
Initial	$478,147	$298,843	$179,305
1987	458,186	259,158	126,471
1988	446,323	225,428	78,145
1989	441,840	197,273	33,789
1990	444,769	175,108	(6,359)
Ending debt-to-asset	0.15	0.66	1.01
STRONG PRICES			
Net farm income			
1987	$ 16,284	($ 3,440)	($ 16,589)
1988	26,387	4,494	(10,101)
1989	34,754	13,013	(3,184)
1990	41,812	20,984	(3,091)
Net worth			
Initial	$478,147	$298,843	$179,305
1987	478,152	279,124	146,437
1988	484,058	268,307	121,057
1989	497,381	265,258	102,594
1990	512,000	268,919	90,368
Ending debt-to-asset	0.12	0.48	0.83

Table 4. Projected Financial Situations of Midwest Dairy Farms

Scenario	Initial debt-to-asset ratio 0.20	0.50	0.70
WEAK PRICES			
Net farm income			
1987	$ 26,503	$ 11,614	$ 1,687
1988	22,693	9,236	(1,783)
1989	21,339	9,105	(2,954)
1990	25,362	13,570	221
Net worth			
Initial	$360,966	$225,603	$135,362
1987	371,190	220,938	120,770
1988	372,062	213,175	103,548
1989	377,025	206,599	85,242
1990	384,160	204,544	70,140
Ending debt-to-asset	0.16	0.46	0.81
MODERATE PRICES			
Net farm income			
1987	$ 36,236	$ 21,347	$ 11,420
1988	31,932	19,545	8,527
1989	30,247	19,482	7,993
1990	33,858	24,313	11,932
Net worth			
Initial	$360,966	$225,603	$135,362
1987	380,923	230,671	130,503
1988	387,498	230,117	122,087
1989	398,426	232,392	114,470
1990	411,443	237,963	110,805
Ending debt-to-asset	0.15	0.38	0.71
STRONG PRICES			
Net farm income			
1987	$ 45,969	$ 31,080	$ 21,153
1988	41,170	29,184	18,835
1989	39,155	28,390	18,767
1990	42,354	32,809	23,314
Net worth			
Initial	$360,966	$225,603	$135,362
1987	390,656	240,404	140,236
1988	402,353	245,711	139,044
1989	418,553	253,998	140,710
1990	436,793	264,183	145,645
Ending debt-to-asset	0.14	0.36	0.62

Weak Prices

For the scenario with weak milk prices, net farm income is strong and net worth increases for the farm with an initial debt-to-asset ratio of 20 percent. The farmer with an initial debt-to-asset ratio of 50 percent generates a positive net farm income, although net worth declines. This farm can survive for a period of time under these conditions even with the low milk prices assumed here. However, the farm with an initial debt-to-asset ratio of 70 percent is not likely to survive an extended period of time with low prices. Net worth declines rapidly and the debt-to-asset ratio has risen to 81 percent at the end of the fourth year.

Moderate Prices

All three farms are able to generate positive net farm incomes in the moderate price scenarios. In addition, the farms with initial debt-to-asset ratios of 20 to 50 percent are able to increase net worth and reduce their debt-to-asset ratios. Only the dairy farm with an initial debt-to-asset ratio of 70 percent decreases its net worth with moderate prices; net farm income is insufficient to cover family living expenses. The inclusion of off-farm income, however, allows this farm to nearly maintain the initial debt-to-asset ratio of 70 percent.

Strong Prices

For the scenario with strong milk prices, net farm income is positive and strong for all three simulations, particularly for the dairy farms with initial debt-to-asset ratios of 20 to 50 percent. Net worth is increased and the debt-to-asset ratio is reduced in each case. The results of these simulations are optimistic for dairy farms if strong milk prices are maintained in the future.

CONCLUDING REMARKS

The simulations presented here provide an optimistic outlook for hog and dairy farms if the strong prices realized in late fall of 1986 continue in the future. Livestock farmers should also consider farm program participation to increase crop returns.

Prepared by David Neff, Agricultural Economist and David Lins, Extension Specialist, Farm Financial Management

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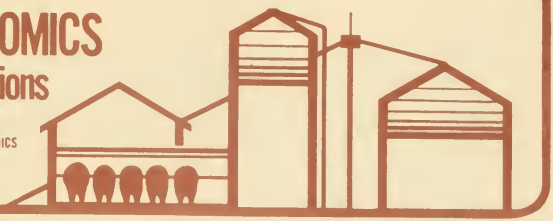

January, 1987

87-1/Crop Production and Marketing Plans for 1987

Although you may have already taken steps to carry out your long-run crop plans, it could be profitable to take a careful look at prices and costs and the provisions for participation in the Feed Grain and Wheat Programs for 1987 to see whether some changes should be made in your cropping program for the upcoming year.

1987 PROGRAMS PROVISIONS FOR FEED GRAINS & WHEAT

TARGET PRICES AND LOAN PRICES. For a 1987 crop, the target prices will be $3.03 for corn and $4.38 for wheat, the same levels as 1986. The announced loan rates will be $1.82 for corn and $2.28 for wheat. The base loan rate for soybeans continues at $5.02 price level but may be reduced by 5 percent to $4.77, if the Secretary of Agriculture deems it necessary. Deficiency payment rates are calculated as the difference between the target price and the higher of the average price that farmers received for the commodity during the 1987 grain marketing year or the

Table 1. Program Provisions and Payment Rates, 1987

	Corn	Sorghum	Barley	Oats	Wheat
Required acreage reduction (% of base)....	20.0	20.0	20.0	20.0	27.5
Maximum permitted acreage (% of base).....	80	80	80	80	72.5
Cash land diversion (% of base).....	15	15	15	15	NA
Target price.....	$3.03	$2.88	$2.60	$1.60	$4.38
Announced nine-month loan price.....	1.82	1.74	1.49	.94	2.28
Maximum deficiency payment rate.....	1.21	1.14	1.11	.66	2.10
Deficiency subject to payment limitation.....	.75	.70	.74	.42	1.53
Projected deficiency payment rate.....	1.21	1.14	1.11	.55	2.10
Advance deficiency rate					
Cash.....	.242	.228	.222	.11	.42
PIK.....	.242	.228	.222	11	.42
Cash diversion payment rate.....	2.00	1.90	1.60	.80	NA
Advance diversion rate					
Cash.....	.50	.425	.40	20	NA
PIK.....	.50	.425	.40	.20	NA

the 130-bushel corn yield level. Higher corn prices increase returns over variable costs per acre for nonparticipants. Net returns per acre for participants do not change because increases in seasonal average market prices are offset by reduced deficiency payment rates.

At expected yield levels near the program yield, there is little difference between net crop income from participation in 20 percent set aside and from participation in optional 15 percent land diversion for feed grains. In a marginal sense, the simple comparison is between the net returns from 1 acre of paid land diversion (ASCS yield x $2.00 less conservation cover costs) and net returns from one acre planted to corn (yield of corn x $3.03 less variable production costs). The critical considerations are the amount of variable costs and the production yield risk.

Livestock producers considering participating in the program should compare the quantity of feed grains that could be raised on the idled acres required for participation with the amount of feed grains that could be purchased with some of the expected deficiency and diversion payments plus the crop costs saved by the idle acres.

Producers should carefully budget alternatives to their situation using worksheet AE-4543, *Income Possibilities: Participation versus Non-Participation in 1987 Government Program for Corn or Wheat.* Copies of this worksheet are available in county Extension Offices.

R. A. Hinton

R.A. Hinton, Extension Specialist, Farm Management

TABLE 2. Comparison of Crop Returns per Acre, 1987

	Acres	Production or Base (bu. or ton)	Harvest Price or Rate per Unit	Crop Returns or Payment	Variable Costs[1]	Net Returns Over Variable Costs
CORN (Not participate)....	1.0	90	$1.70	$153.00	$110.00	$ 43.00
Participate - 20% RAP						
Corn.....	.8	72	1.70	122.40	88.00	
RAP (deficiency for.8A)[2]	.2	69.2	1.21	83.73	4.00	
Composite base acre...	1.0			$206.13	$ 92.00	$114.13
Participate - 20% RAP + 15% Diverted Acres						
Corn.....	.65	58.5	1.70	$ 99.45	$ 71.50	
RAP (deficency for.65A)[2]	.20	56.2	1.21	68.00	4.00	
Diversion.....	.15	13	2.00	26.00	3.00	
Composite base acre...	1.00			$193.45	$ 78.50	$114.95
CORN (Not participate)....	1.0	130	$1.70	$221.00	$134.00	$ 87.00
Participate - 20% RAP						
Corn.....	.8	104	1.70	176.80	107.20	
RAP (deficiency for.8A)[2]	.2	100	1.21	121.00	4.00	
Composite base acre...	1.0			$297.80	$111.20	$186.60
Participate - 20% RAP + 15% Diverted Acres						
Corn.....	.65	84.5	1.70	$143.65	$ 87.10	
RAP (deficency for.65A)[2]	.20	81.25	1.21	98.31	4.00	
Diversion.....	.15	18.75	2.00	37.50	3.00	
Composite base acre...	1.00			$279.46	$ 94.10	$185.36
CORN (Not participate)....	1.0	130	$2.30	$299.00	$134.00	$165.00
Participate - 20% RAP						
Corn.....	.8	104	2.30	239.20	107.20	
RAP (deficiency for.8A)[2]	.2	100	.60	60.00	4.00	
Composite base acre...	1.0			$299.20	$111.20	$188.00
Participate - 20% RAP + 15% Diverted Acres						
Corn.....	.65	84.5	2.30	$194.35	$ 87.10	
RAP (deficency for.65A)[2]	.20	81.25	.60	48.75	4.00	
Diversion.....	.15	18.75	2.00	37.50	3.00	
Composite base acre...	1.00			$280.60	$ 94.10	$186.50
SOYBEANS.....	1.0	30	4.50	$135.00	$ 65.00	$ 70.00
		45		202.50	73.00	129.50
		60		280.00	81.00	189.00
WHEAT (Not participate)...	1.0	54	2.00	$108.00	$ 63.00	$ 45.00
Participate						
Wheat.....	.725	39.2	2.00	78.30	45.70	
RAP (deficiency on .725 A.)[2].....	.275	37.6	2.10	79.20	5.50	
Composite.....	1.000			$157.50	$ 51.20	$106.30
DOUBLE CROP SOYBEANS.....	1.0	20	4.50	$ 90.00	$ 59.00	$ 31.00
WHEAT & DC SOYBEANS						
Not participate.....	1.0			$198.00	$122.00	$ 76.00
Participate						
Composite base acre.....	1.0			$222.75	$ 94.00	$128.75
OATS.....	1.0	60	$1.00	$ 60.00	$ 49.00	$ 8.00
		80	1.00	80.00	52.00	25.00
		100	1.00	100.00	57.00	40.00
HAY.....	1.0	3.0	$50	$150.00	$ 68.00	$ 82.00
		4.5	50	225.00	90.00	135.00
		6.0	50	300.00	115.00	185.00

[1] Includes seed, pesticides, fertilizer, machinery repairs and fuel, drying costs, and interest on operating capital only.

[2] Quantity for payment is program yield times acres planted. Assume ASCS program yield of 86.5 or 125 bushels for corn and 52 bushels for wheat.

Table 3. Estimated Costs Per Acre for Producing Crops, 1987

	Rotated corn (135 bu.)	Second-year corn (125 bu.)	Grain sorghum (120 bu.)	Soybeans (45 bu.)	Wheat (54 bu.)	Oats (80 bu.)	Double-crop soybeans (20 bu.)	Set aside cover crop	Alfalfa hay (4.5 tons)
Variable costs:									
Seed	$ 20	$ 20	$ 6	$ 9	$ 10	$ 8	$ 11	$ 4	$ 10
Pesticides	16	30	13	18	1	1	25	..	7
Fertilizer									
N	26	26	23	..	14	12	..	..	..
P, K, Lime	19	18	16	17	16	12	6	4	40
Mchy. rep. & fuel	30	30	27	25	18	16	14	7	28
Dry. fuels & rep.	16	15	18	..	..	..	..	..	..
Interest on operating capital	7	8	6	4	4	3	3	..	5
Total variable costs	$134	$147	$109	$ 73	$ 63	$ 52	$ 59	$ 15	$ 90
Other costs:									
Mchy. depr. & int.	$ 45	$ 45	$ 42	$ 40	$ 32	$ 32	$ 25	$ 22	$ 40
Labor	21	21	20	20	10	10	10	5	40
Management	10	9	8	10	6	4	5	..	14
Storing (int. & bin)	23	21	19	15	11	11	7	..	34
Misc.	15	15	15	15	15	15	8	8	15
Total other costs	$114	$111	$104	$100	$ 74	$ 72	$ 55	$ 35	$143
Land costs (cash rent)	$ 80	$ 80	$ 80	$ 80	$ 80	$ 80	$	$ 80	$ 80
Total all costs	$328	$338	$293	$253	$217	$204	$114	$130	$313

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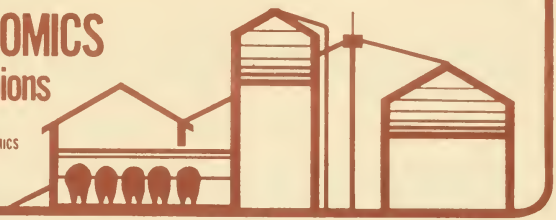


February 1987

87-2/Changes in Meat Demand

The red meat industry is an important source of farm income in Illinois. Hogs provide 16 percent of cash farm income; cattle account for another 10 percent. Poor profitability in recent years has led to declining numbers of hogs and cattle in Illinois as well as in the rest of the United States. Many producers have blamed low real livestock prices on a decline in consumer willingness to eat red meat. This newsletter reviews the changes in meat demand and their implications for the future of the red meat industry.

WHAT HAS HAPPENED TO MEAT CONSUMPTION?

Annual total meat consumption--red meats plus poultry--has grown from 169 pounds per person in 1965 to 211 pounds in 1985, but the percentages of poultry, pork, and beef consumed have changed. Poultry consumption grew steadily over the last twenty years from 41 pounds per person in 1965 to 70 pounds per person in 1985 (Figure 1), and the rate of growth has increased in recent years. Pork consumption fluctuated around a long-run average of 60 pounds per person from 1965 to 1985. Beef consumption peaked in 1976 and then fell sharply. Average beef consumption from 1979 to 1985 was 78 pounds per person and less than the average of 81 pounds from 1965 to 1972. Beef's

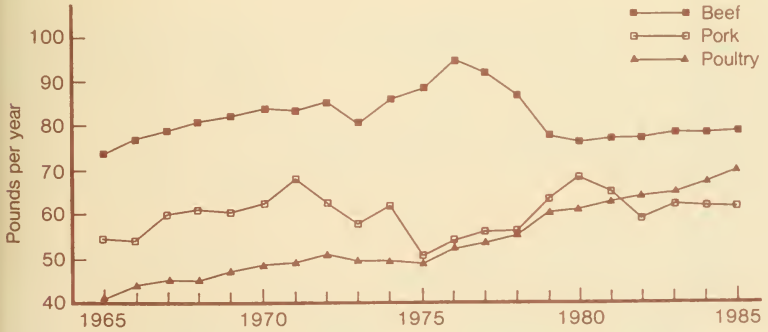


Figure 1. Per capita meat consumption, 1965 to 1985 (pounds per year).

share of meat intake declined from 44 to 37 percent over the last twenty years, whil poultry's share increased from 25 to 33 percent. Pork's share declined slightly fro 31 to 29 percent.

DO THESE TRENDS MEAN THAT DEMAND HAS CHANGED?

A change in consumption is not the same as a change in demand. Meat consumption changes when consumers respond to changes in meat prices and consumer income. But changes in meat consumption can also occur because of changes in consumer preferences. Changes in consumption due to changes in consumer preferences are true changes in demand. A change in demand requires a change in the willingness of consumers to buy meat, even when prices do not change.

The distinction between changes in prices and changes in preferences is important fo the red meat industry. If beef consumption has declined because chicken has become cheaper, then the beef industry needs to reduce costs to stay competitive in terms o price. If beef consumption has declined because consumers now prefer chicken, then the beef industry needs to focus on product development and promotion.

WHAT TYPE OF CHANGE HAS OCCURRED?

A look at the relative prices of meat illustrates why beef consumption fell and why chicken consumption increased. The price of beef increased relative to the price of chicken after 1978 (Figure 2). Chicken has always been the cheapest meat, but it became even cheaper relative to beef. The price of beef also increased relative to the price of pork. Consumers ate less beef because it was more expensive, and more chicken because it was cheaper. In addition to these relative changes in price, consumer income grew more slowly in the early 1980s because of the economic recessio in 1981 and 1982. Consumers had fewer extra dollars to spend on increased meat consumption and more reason to shift to cheaper poultry products.

Changes in meat prices and consumer income explain most of the changes in chicken an pork consumption, but only about half of the changes in beef consumption. Various

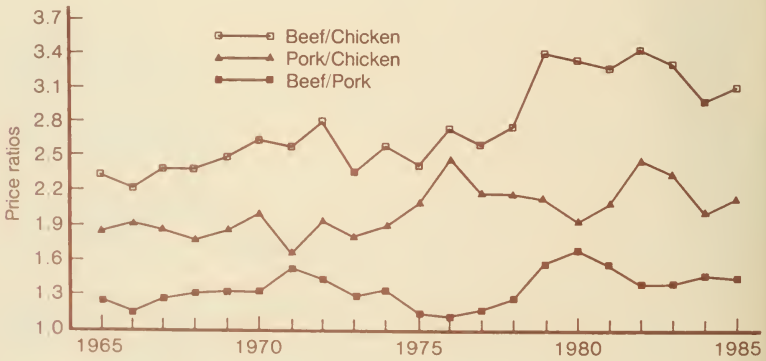


Figure 2. Ratios of retail meat prices, 1965 to 1985.

studies of meat demand have concluded that some type of change in beef preferences occurred in the late 1970s. Consumers became less willing to buy more beef when beef prices fell, less willing to spend additional income on additional beef consumption, and more willing to substitute chicken for beef.

WHAT MIGHT HAVE CAUSED THE CHANGE IN DEMAND?

Health concerns about the fat and cholesterol in red meat are frequently cited as a cause of changed meat preferences. But why would health concerns only alter the demand for beef and not the demand for pork? Cutting down on beef alone because of health concerns would be inconsistent.

Another possible cause of the change in beef demand is the changing composition of the U.S. population. The characteristics of the "average" consumer have altered over time, so average consumption might have changed. For example, the proportion of nonwhites increased from 13 percent of the population in 1970 to 17 percent in 1980. As nonwhites consume more pork and chicken than whites, average pork and chicken consumption would tend to increase slightly.

Another demographic change is the aging of the population. The proportion of the population over 65 has increased from 10 percent in 1970 to 12 percent in 1983. This aging should lead to a decline in average beef consumption. After age 65, beef consumption falls by 31 percent, but pork consumption falls by only 15 percent, and and chicken consumption falls by only 10 percent. With lower birth rates and the aging of the baby boom generation, there will be a larger proportion of senior citizens and slightly smaller average beef consumption.

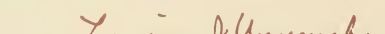
Changes in the distribution of income growth since 1978 have also had an adverse effect on beef consumption. The proportion of the population in middle income groups having an annual household income between $20,000 and $47,000 declined. Most of those leaving the middle group experienced a drop in real income. Income growth from 1978 to 1986 was more concentrated than in previous years in the upper income group, which has an annual household income greater than $47,000. Because middle income groups have the biggest increase in beef consumption when their income grows, this distribution of income growth has not favored growth in beef consumption.

The changing structure of American households and the increasing participation of women in the paid work force have probably altered consumption preferences. Households headed by single persons increased from 13 to 23 percent of all households between 1960 and 1980. Households headed by females increased dramatically from 9 to 16 percent of all households during the same period. The proportion of women between the ages of 25 and 44 who work for pay increased from 40 percent in 1960 to 66 percent in 1980. These trends mean that the value of time has increased for the principal meal planner and preparer, so the demand for convenience has risen. As households headed by females have lower incomes than the average, these households will be interested in both convenience and value.

It is interesting that the broiler industry has been able to increase the convenience of their product over time. The proportion of broilers marketed as cut-up parts increased from 19 percent in 1965 to 53 percent in 1985; processed products grew from 3 to 17 percent during the same period. Less convenient, whole birds declined from 70 percent in 1965 to 30 percent in 1985. Red meat products have always been "cut-up," but chicken now has both a price advantage and equivalent convenience.

Chicken has become relatively cheaper over time so that it is more competitive with both red meats. The declining cost of chicken accounts for a large portion of the changes in American meat consumption. In order for red meats to maintain their market share in the future, they will have to offer reduced prices relative to the price of chicken. The pork industry has slowed market-share loss in the 1980s with sharp declines in the real price of pork due to reduced costs of production. Beef lost its share of the market more rapidly than pork because the price of beef increased more relative to the price of chicken. Cost reductions in beef production would allow producers to offer a cheaper product at a profit--a measure that would enable beef to regain some share of the market.

Beef demand also seems to have suffered from a change in consumer preferences. Even if prices had not changed, consumers would be less willing to buy beef now than they were in the early 1970s. Health concerns do not seem to explain sufficiently this shift in preferences. Therefore promotional efforts that focus on health issues may have only a limited effect in boosting consumer demand. Developing products that meet the taste and need for convenience of the changing American consumer will be a more effective strategy for restoring consumer demand for beef.



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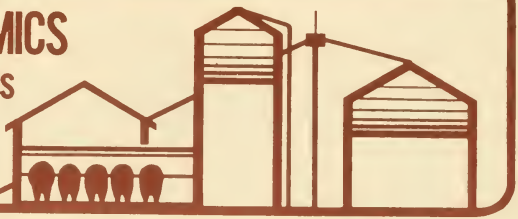
URBANA, ILLINOIS 61801



February 1987

87-3/Growing Older in Rural America

"Why do I have to grow old?" was Bruce's question during a series of interviews with 140 retired farm couples, widows, and widowers. Bruce's 45-year-old daughter answered her father's question: "Dad, you don't have to grow 'old,' but we want you to grow 'older.' If you don't, the alternative is not very pleasant--for you or for us!"

There is a difference between "growing old" and "growing older!" After all, hasn't your goal been to "grow older" since the day you were born? So keep on doing that each day of your life. But don't ever let yourself "grow old."

Before you retire, choose whether you want to drift into retirement or whether you want to plan and prepare to make the top third of your life satisfying, self-enriching, useful, and rewarding.

As you "grow older" there come the questions, "Should I quit farming?" "Should I retire?" "When?" or "Should I 'just die with my boots on?'"

Whatever the answer for you, here are some guidelines to help you think about, talk about, and make plans for your "older" years--wise suggestions from the retired farm folks who were interviewed.

THERE WILL BE MORE OF US.

The ranks of older Americans surged dramatically during the 1970s. In a new study, the U.S. Census Bureau reports that the number of persons aged 65 and over jumped 23 percent from 1970 to 1979. In 1930, one of every twenty Americans was over 65; today it's one of every ten.

Predictions for the year 2000 are one of every eight, and for 2035--when today's teenagers will be in their sixties--one of every five and possibly one of every three or four will be 65 and older.

So planning for your "older" years is as critical as the planning you've done thus far in your life.

THE LONGER YOU LIVE, THE LONGER YOU'RE GOING TO LIVE.

One of the far-reaching developments of this century is the lengthening of the life span. In 1900, the average American life expectancy at birth was 45 years. By 1930, that had been extended to 64 years and by 1980, to 78 years. Today, golden wedding anniversa- ries are not an uncommon American celebration.

And what about average life expectancies for older Americans? In 1930, an average 55-year-old female could expect to live 20 more years and in 1980, 27 more years.

The key to successful retirement living is planning well in advance of your scheduled exit from the world of full-time farming, not postponing it to the last possible moment. Many of the 140 retired farm couples recommended that retirement planning should begin well before you quit farming, slow down, or turn the business over to the next generation. But one word of caution: never let those plans fence you in. Be ready for changes. Remain flexible.

CHANGES, CHANGES, CHANGES!

Just as you've adjusted to change while you've been farming, so you will need to adjust to change as you quit farming, slow down, or even keep on farming to "die with your boots on."

While you have been farming, many changes have occurred outside of agriculture: the atom bomb, objects and persons in space and on the moon, antibiotics, television, sedatives, pain killers, new surgical procedures, laser beams. Changes will continue to occur that will affect your retirement lifestyle.

In the interviews, the retired farm couples shared many "changes" they had handled since retiring--some successfully, some not so successfully: 1) change in their "people circle" or persons with whom they spent their time, such as family, friends, or others; 2) more togetherness: "...twice as much husband and half as much pay," joked one farm wife; 3) health limitations: you or your mate may develop health problems that drastically change both of your lifestyles; and 4) more idle--and sometimes boring--time may creep into the daily schedule.

During the coming years, family, governmental, cultural, and economic institutions will have to accommodate the changes in society brought on by the shift from a youth-oriented culture to one in which the fastest growing segments of the populations are middle-aged and older people.

TALK ABOUT IT.

Talk with your spouse, your children, other family members, trusted friends, and counselors about "retirement," "growing older," "what it will be like." Don't be like the Illinois farmer who planted corn in his 42nd year of farming and announced to his wife, "I am going to retire when we harvest this corn next fall, and we're moving to Florida," when neither of them had ever been to Florida. After living--unhappily--in Florida for two years, he then announced, "We're selling our house here and moving to Galveston, Texas. Again, neither had been to Galveston. A year later while visiting a cousin who was wintering in the Southwest, both he and his spouse decided that was where they wanted to live. They sold the Galveston house and moved to Arizona. For nine years life was fine in their double-wide mobile home. Regretfully, he said "We just wasted four years of our retirement because we didn't "talk about it."

WHERE YOU LIVE.

You have lived where you have farmed. Where you live when you retire is a "new ball game." You have some new options: move into a smaller house on the farm or in a nearby village; rent or buy a house in the county seat or a larger town or city; rent an apartment; buy into a retirement village or a life-long living facility; buy a condominium, move to "sun country."

Regardless of where you decide to live and in what you decide to live, you should

- Be near people you like or love and who feel the same about you.

- Know you can live comfortably and have a full life despite any handicaps.

- Have access to facilities and services you'll need for comfort and contentment.

- Feel you "belong" in the community or in your "people circle."

- Feel mentally at ease and physically safe.

But, by all means, if you decide to move, check it out--try it out. Look before you leap!

KEEP ON GIVING -- OF YOURSELF, THAT IS.

"Time hung heavy on my hands," "I was bored," "I climbed the walls," "I didn't have anything to do," "I felt I wasn't worth anything when we first retired," were typical comments from retired farm folks.

How did they solve these bugaboos? Generally with activities where they gave of themselves for or with someone else: volunteering, part-time job, creative hobbies, doing things for others on a somewhat regular schedule. If you begin to feel sorry for yourself--not genuine sorrow, but the "poor put-upon me" variety--the best way to deal with this is to do something for someone else.

Satisfying, newly-found leisure when you retire isn't something that's automatically going to happen to you. Most people must plan for it. Today, while you're still farming is the time to set a few new leisure-time goals and try out some activities other than farming or being a farm homemaker. As Alan Harrington wrote in his book, *Life in the Crystal Palace*, "We are all, it seems, saving ourselves for the 'senior' prom. But many of us forget that somewhere along the way...and surely before the prom...we must learn to dance."

Your adjustment to retirement's abundance of time will be easier if you regard leisure, play, and loafing as important and necessary parts of a well-rounded person. "We don't stop playing because we grow older; we 'grow old' because we stop playing."

YOU ARE WHAT YOU EAT.

Proper nutrition is a must whether you're 8 or 80. Eat a variety of foods from the four food groups: 1) milk and cheese, 2) vegetables and fruits, 3) meat, poultry, fish, and beans, and 4) breads and cereals. Eat other foods with caution.

Retired farm folks often reported that they gained weight, "got fat" when they quit farming. They handled the situation by eating a balanced and varied diet, consuming less, and exercising more.

KEEP THE LEGS GOING.

Typical was Henry's response:

> "Our retirement lifestyle was drastically different. We took trips, did some fishing, slept late, and ate out often. Being around the house more, I snacked and 'warmed' the rocking chair in front of the TV. "Hilda and I put on weight. I was having sleepless nights, didn't feel good. My friend, a former coach, challenged us to 'get more exercise.' So we started walking. I'm learning to swim at the Y. Now we walk a mile three times a week. We've both lost weight, feel better, and have more energy to do the things we've looked forward to in our retirement."

Physical decline need not happen when you retire. Retirement is not necessarily a time to slow down and do less. Much of physical frailty attributed to aging is actually the result of muscular disuse and poor diet. You can lower your rate of physical decline through proper eating habits and getting some physical activity into your daily life.

DON'T GIVE IT AWAY TOO SOON.

Some retired farm couples said that when they retired, they started "gifting" to children and others their wealth and possessions. Why? "To avoid tax when we die." But one couple, ages 94 and 92 and retired 34 years, said, "We've lived longer than we expected. We now need some of the money we gave away 30 years ago."

As you think about, talk about, and make plans for the top third of your life, if retirement appears to be a strange land you are preparing to visit, there's good news. The people there speak your language. And it is a language with which you are familiar: $ $ $!

Money will continue to have its familiar role after Social Security payments begin to appear each month on your bank account statement or in your mailbox.

You will not be able to exchange money for everything you want, just as you haven't while you've been farming. You'll have priorities then just as you have now. They might be different, but you'll still have them. Many of the retirement satisfactions and comforts will be closely related to having those dollars at the right time and in the right amount.

Peter A. Dickinson, in his *The Complete Retirement Planning Book,* advises, "Chances are you'll find that no matter at what age you retire, or how much or how little money you have now, you must change to the changing conditions. Your income and your expenses will change; interest rates and investment returns will change.... To be financially free during retirement, you'll need:

-savings for emergencies,

-guaranteed income to meet expenses,

-investment income to move up and down with inflation, and

-some form of security for now and in the future."

Diversify your investments so your wealth does not rise and fall solely on land values.

DON'T "HANG IN THERE" TOO LONG.

"When I was 60, I told my sons I thought I could help out on the farm until I was 65. I'm 66 now and I think I can still go another five years!"

But the older one grows, the more difficult it becomes to make the adjustments to retirement. Some retired farmers said they thought the best thing they did was to "step aside and turn the farm over to the next generation."

Preparing for lifestyle changes when you retire requires accepting inevitability, just as you have accepted and coped with change during your whole life. To acknowledge that one's youth and energy must wane is a measure of maturity. It is the law of nature and therefore an unwritten provision in the charter of every human family and its members. Stepping aside and getting out of the way of the next generation may be the most valuable service you can render.

But it is by no means a final service. For as you step aside and look at things from a different perspective, you can observe--with satisfaction or disgust--the effectiveness of having taught the next generation. It is then that your service to your spouse, children, relatives, friends, and organizations can be most rewarding. With careful foresight and planning you can prepare a retirement program that allows you a sense of continuing achievement and self-satisfaction, yet reserves time to share your hard-earned expertise.

What is retirement? One retiree said, "It is doing what you want to do when you want to do it."

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FARM ECONOMICS
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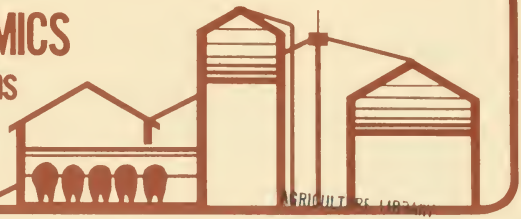

March 1987

87-4/The World Bank, Economic Development, and Future Markets for U.S. Agricultural Exports

In the past few years, U.S. assistance to agriculture in other countries has provoked considerable controversy in discussions of farm policy. Opponents of further assistance have blamed it for the farm crisis at home. Others have defended this assistance because it has served our enlightened national self-interest and the long-run interests of U.S. agriculture. Presented to the U.S. Feed Grains Council in August, 1986, this paper by Dr. G. Edward Schuh provides information about one type of foreign assistance that is supported in part by the United States: the World Bank.

Dr. Schuh spent many years as Head of the Department of Applied and Agricultural Economics at the University of Minnesota. In 1985, he joined the World Bank as Director of Agriculture and Rural Development. The opinions expressed here are those of Dr. Schuh and do not necessarily represent those of the World Bank or the University of Illinois.

Many U.S. farmers have gone through unusual economic stress these past five years as foreign markets for their commodities have contracted, the relative prices of their commodities have declined, and their assets have experienced an unusual collapse in value. These developments have occurred in a poorly understood world in which the U.S. economy has grown so open to trade that it is increasingly beyond the reach of domestic programs. Monetary and fiscal policies and the international capital market have had a greater impact on the welfare of U.S. agriculture than domestic commodity programs.

It is not surprising that under these circumstances farmers and their representatives should be critical of whatever seems to contribute to their problems. An increasingly important target in recent months has been the efforts of The World Bank and the U.S. Agency for International Development (AID) to strengthen agriculture in developing countries.

I would like to divide my comments into four parts. First, I will provide some background on the World Bank and its program. Second, I will establish the link between agricultural development in developing countries and markets for U.S. agricultural commodities. Third, I will consider the issue of playing on a level playing field. And finally, I will discuss economic growth and liberalization of trade as the keys to future agricultural markets.

THE WORLD BANK

The World Bank was created at the end of World War II as one of the Bretton Woods twins--its sister being the International Monetary Fund (IMF). The Bank was known as the International Bank for Reconstruction and Development (IBRD) in its original incarnation. That name still applies to the main component of the Bank. The original mission of the Bank was the reconstruction of war-torn Europe and other countries affected by the war, primarily by means of longer-term investments in physical infrastructure and physical capital. Its present focus on the developing countries came only later, although this objective was foreseen in its original charter. The IMF, for its part, was designed to help countries experiencing problems with their balance of payments by granting them short-term loans to help them get through difficult adjustment problems.

The Bank is owned by 150 member countries who have subscribed its capital. Day-to-day operations of the Bank are guided by a Board of Executive Directors nominated b the member countries. Voting is proportional to the amount of capital contributed. Having contributed about 20 percent of the Bank's capital, the United States has 20 percent of the vote. Lest you think that this is an excessively high share of the capital, keep in mind that the United States accounts for 30 percent of world GNP. In that sense it has not contributed its proportional share of the operations of th Bank.

The Bank is made up of three main components and thus is often referred to as the World Bank group. The most important of these is what was originally created as th IBRD, although now it too is commonly referred to as the World Bank. This componen of the Bank is a financial intermediary just like any other bank in that it borrows from international capital markets and relends this capital to developing countries at near commercial rates. In the process the Bank makes a profit. Its lending rates tend to be about a half a point below regular commercial rates. The difference in rates is accounted for by the ability of the Bank to borrow at lower rates than most commercial banks. Contrary to regular commercial banks, the World Bank does not accept deposits.

In the fiscal year just ended, total lending of this component of the Bank was US$13.2 billion. The goal for the current year is US$15 billion.

The second component of the Bank is the International Development Association (IDA) The IDA was created in the 1970s, largely at the instigation of the United States. It loans to the poorest of the poor countries at a zero interest rate and for a period up to 50 years. These countries do have to pay a service charge of about a half percent, and they also have to pay the loan back. Hence, this is not grant money.

The goal has been to provide US$4.0 billion of IDA lending each year. Because the United States did not come through with the amount expected in the last subscrip-tion, however, IDA lending has not met that goal. In the fiscal year just completed, total lending was only US$3.1 billion, but this amount was augmented by US$780 million from the Special African Facility.

The third component of the Bank is the International Finance Corporation (IFC), which makes direct investments in private companies in the developing countries.

The IBRD and the IDA lend their money directly to national governments. The IFC, in contrast, is designed to promote the development of the private sector. Like the IBRD, it borrows the money it lends from capital markets.

The total lending from IBRD and IDA for agriculture this past year was US$4.7 billion, which was about 30 percent of total Bank lending. In recent years, this proportion has generally been about 25 percent of a smaller total loan portfolio. That percentage is about what it is expected to be in the near future in terms of the share, but total lending is expected to increase.

To put this agricultural lending in perspective, a comparison with the ending of the U.S. Farm Credit System is useful. In 1984, the last year for which data are available, the gross loans and refinancing of the Farm Credit System was US$64.4 billion. This figure is the closest I could find to the US$4.7 billion agricultural lending of the World Bank for the agriculture of all developing countries this past year. The numbers are not directly comparable, but they do help put the Bank's lending program in perspective.

Now let me say something about the nature of the Bank's lending program. Traditionally, the Bank has engaged in what is described as project lending. In other words, it provided funding for construction of dams, irrigation projects, roads, railroads, ports, and other components of physical infrastructure. Moreover, this money was loaned with very few conditions other than those related to these projects per se.

Starting around 1980, however, two important changes were made in the lending program. First, a great deal more attention was given to economic policies in the borrowing countries, and more rational economic policies began to be required as a condition for a loan--what is referred to as conditionality. In the case of agriculture, of course, such reforms can cut two ways. Many developing countries seriously discriminate against their agriculture by means of overvalued currencies, export taxes, marketing boards that buy cheap from agriculture and sell dear, and outright embargoes on agricultural exports. Reducing or alleviating these discriminatory policies strengthens agriculture in these countries, and that is the intent of the conditionality. In some cases, as in the proposed elimination of the agricultural export tax in Argentina, it can even make a country more competitive in foreign markets.

But in other cases, the reforms go the other way. For example, many developing countries provide subsidized credit to their farmers, as well as subsidized fertilizer and other modern inputs. The Bank often requires the phasing out of these subsidies as part of its conditionality. This was the case in the recent loan to Brazil. The phasing out of these subsidies makes these countries less competitive in foreign markets.

The second change in lending policies since around 1980 has been to provide more lending for what is called structural or sectoral adjustment. This lending is designed to help countries restructure their economies in order to develop the means to service their foreign debt, and to help deal with the serious problems with balance of payments that these countries face. Structural and sectoral adjustment loans tend to be fairly large, quick disbursing--over a one- or two-year period, carry heavy policy conditionality and often are not related to a project. A good example is again the recent loan to Brazil, which provided US$400 million out of a US$500 million loan to finance imports over a two-year period, a portion of which is expected to be agricultural commodities--rice, wheat, corn, and beef. (The remaining US$100 million of that loan, incidentally, is to finance improvements in the domestic marketing system.)

There is one other aspect of the character of the Bank's lending program that is important. The bank's emphasis on agriculture became significant in the early 1970s. But this increased attention was motivated not so much by a desire to increase agricultural production as it was to improve the incomes of rural people. The bulk of the poverty in the world is located in agriculture, and in many developing countries per capita incomes in the urban sector are larger than per capita incomes of rural people by a factor of two or three. This concern about poverty still dominates the agricultural lending program: the Bank is committed to allocating about half of the funds in its agricultural lending program to alleviate poverty.

AGRICULTURAL DEVELOPMENT IN DEVELOPING COUNTRIES AND FUTURE MARKETS FOR U.S. AGRICULTURE

The World Bank and the U.S. Agency for International Development have recently come under fire from U.S. commodity groups and their representatives in Congress for their efforts to strengthen agriculture in developing countries. These efforts in my judgment are counter-productive in terms of the best interests of U.S. agriculture. U.S. commodity groups and their representatives in Congress should be supporting development efforts abroad, not trying to abort or stop them. Both the logic and the data in support of this position are clear and extensive. Consider the issues, which can be summarized in the following four propositions.

First, *future foreign markets for U.S. agriculture will be in developing countries, not in other industrialized countries or in centrally planned countries.* (I includ China among the developing countries.) Even if the European Economic Community (EEC) were to liberalize completely its agricultural policies, our total exports to that market are not likely to increase, although the commodity mix might shift away from soybeans toward corn and feedgrains. Whether the Soviet Union will have the where-withal to import additional grain, or even to sustain present levels, is an open question.

Second, *developing countries will constitute a growing market for U.S. producers only if they experience significant economic development.* The experience of the 1970s, when imports of wheat and coarse grains by developing countries increased from 20.4 to 58.6 million metric tons, provides an object lesson in this regard. Over 70 percent of these imports were sent to developing countries having upper-middle incomes and experiencing rapid increases in per capita income. Poor countries that exist in near-Malthusian conditions simply do not have the means to pay for imports.

Third, *developing agriculture is the key to economic growth in developing countries* The bulk of their resources are in their agricultural sector, which is typically characterized by general low-level productivity. Increasing productivity (and incomes) in this sector is the key to raising per capita incomes in the economy as a whole, and in the short run it is often the only means by which these countries can earn the foreign exchange to further their own economic development.

Fourth, *raising the productivity of agriculture in developing countries need not, as a general proposition threaten U.S. producers with competition.* The populations of most developing countries grow between two and three percent per year. Given their low level of per capita incomes, the income elasticity of demand for agricultural commodities in the aggregate tends to be much higher than in the United States and

other industrialized countries. If we assume a plausible 0.6 for this income elasticity, a relatively modest 3 percent growth rate in per capita incomes, together with a 2 percent growth rate for the population would result in a 3.8 percent growth rate in demand for agricultural output. If we assume a more optimistic growth rate of 5 percent in per capita income and a 3 percent growth rate for the population, the growth rate in demand for agricultural output would be 6 percent.

Two points are important in providing perspective on these data. First, obtaining a growth rate in agricultural output between 3.5 and 4.0 percent per year on a sustained basis is not easy. Few countries have done it in the past, except when there have been extensive new lands to bring into production, as in the case of Brazil. Not many developing countries still have such stocks of land available.

Second, increases in per capita income between 3 and 5 percent per year are not unusual in countries that lag in their development and therefore can play catch-up by adopting technology from abroad. Japan, South Korea, and other newly industrialized countries, such as Brazil and Mexico, have all performed better than this for extensive periods of time.

There is another feature of increases in per capita incomes in these countries that is important for U.S. agriculture: a rise in per capita incomes leads not only to upgrading the quality of the diet, but also to a change in the configuration of demand toward commodities that are less time-intensive in terms of household preparation. Both of these changes favor U.S. agriculture. The upgrading of diets means more rapid growth in the demand for poultry, livestock, and livestock products. This growth in turn implies an increase in the demand for feedgrains--commodities for which the United States has an obvious comparative advantage. The shift to commodities that are less time-intensive in terms of household preparation, for instance, involves a shift away from rice toward wheat. In the aggregate, this shift also favors the United States, although obviously not U.S. rice growers.

The analysis I have traced out suggests that instead of lobbying to curtail efforts by the World Bank and the U.S. Agency for International Development to strengthen agriculture in the developing countries, U.S. commodity groups should seek to support and strengthen these efforts. This is a case of enlightened self-interest: knowing on which side one's bread is buttered. It includes investments in agricultural research, which are so important for raising the productivity of resources in agriculture and in turn per capita incomes.

PLAYING ON A LEVEL PLAYING FIELD

It is popular these days for U.S. commodity groups to talk about playing on a level playing field--a perspective which implies that U.S. agriculture is often put upon by others. In one sense there is justification for this concern, especially when it refers to the policies of Japan and the EEC. But we also need to recognize that we have experienced some important self-inflicted wounds these past five years, and that our own policies are also often very detrimental to others.

When it comes to shooting oneself in the foot, the 1981 farm bill was an outstanding example. The predetermined increases in loan levels in that legislation would probably eventually have priced U.S. agriculture out of foreign markets without any other developments, especially as inflation was brought under control. But the large rise in the value of the U.S. dollar brought about by contradictory monetary

and fiscal policies caused it to happen in spades. Candor demands that we admit the self-inflicted nature of these wounds and are aware that the high prices these policies created in currencies of other countries have contributed importantly to the large supplies we have in today's markets.

Our policies historically have had a detrimental impact on other countries, especially low-income countries. Although in the past, U.S. policies were less detrimental than those of the EEC, the 1985 farm bill has succeeded in putting us almost on a par with it.

Consider our sugar legislation. The high protection of this section has provided the means for the development of a high fructose corn sweetener industry, which has made rapid inroads into the domestic market for sugar. In addition to imposing high costs on domestic consumers--about US$3 billion a year, the development of this industry has led to steady reductions in U.S. import quotas, taking away markets from developing countries. The Caribbean Initiative and associated efforts to restructure agriculture in that region are little more than an offset to reduced U.S. imports of sugar.

Consider our other commodity programs. Unless target prices are set at market clearing levels, deficiency payment programs, such as we have had since 1973, are in effect implicit export subsidy programs. Our wheat program, for example, has involved a modest export subsidy of this kind since 1973. Now with the 1985 legislation, this implicit subsidy is being enlarged and extended to other commodities, such as feed grains. These subsidies and the implied dumping they entail cause world prices to be lower than they would otherwise be. Lower world prices not only raise the costs of our own commodity programs in a counterproductive way, but they also inflict significant losses of income on developing countries.

On the surface, these programs may sound like a good way to reduce supplies in other countries and thus to gain a tactical advantage. But we need to recognize the losses of income involved. And we also need to recognize that these programs create protectionist pressures in those other countries.

The same logic applies to our explicit export subsidies, like those involved in the Export Enhancement Program (EEP) and other programs. The negative effect of these programs on the income of low-income countries and the incentives they provide for protectionist measures are not the only issues, of course. There are international political consequences as well. Thailand has traditionally been a political ally of the United States; our rice program is creating stresses in that relationship. Similarly, the wheat program and the extension of the provisions of the EEP to the Soviet Union create stress in our relationships with Australia, Canada, and other traditional allies.

Do we really want our commodity programs to weaken our international political relations in this way? Equally important is the question: do we really want our domestic commodity programs to reduce the income of low-income countries in this way and thus to reduce the demand for commodities for which we have a comparative advantage? And are we justified in demanding a level playing field when our own policies do such economic harm to others? I leave the answers to these questions to you.

ECONOMIC GROWTH AND LIBERALIZATION OF TRADE AS THE KEYS TO FUTURE AGRICULTURAL MARKETS

Much of the recent controversy about World Bank loans and AID efforts to strengthen agriculture in developing countries have implied that the total global economic pie

is fixed, and that one country gains only at the expense of another. In a period of generalized economic stagnation, like the one we have experienced in recent years, there is something to that argument. But that is not the kind of world for which we should be striving. Moreover, protectionist, inward-looking policies are sure to give us a continuation of that kind of world.

Instead, we should be liberalizing trade and dismantling the domestic agricultural commodity programs that trade restrictions are designed to protect. In addition, we should do all in our power to promote the development of low-income countries, for our stake in those countries is great, especially in terms of future markets. (For more details on the economic stake the United States has in the developing countries, see G. Edward Schuh, *The United States and the Developing Countries: An Economic Perspective*, National Planning Association, Washington, D.C., 1986.)

It is true that policy reform and policy liberalization in developing countries can have negative effects on U.S. agricultural markets. The recent World Bank loan to Argentina, which encourages that country to phase out its export taxes, is a case in point. But we need to focus on the larger picture and on the rise in per capita incomes such reforms generate in making our final judgment.

More generally, we need to remind ourselves that the largest importers of agricultural grains among the developing countries in the 1970s were those countries who were also the largest exporters of agricultural commodities. Moreover, imports of grains grew most rapidly in those countries whose agricultural exports also grew most rapidly.

The moral to be drawn from this experience is clear. It is called international specialization and the division of labor. Such specialization is possible when the economic pie is growing. But at the same time, international specialization also helps make the economic pie grow at a faster rate as each country specializes in those commodities for which it has a comparative advantage. The World Bank and the U.S. Agency for International Development are working for that kind of world. We need your support in these efforts. After all, economic development in low-income countries is in *your* best interests.

Our economic world has changed dramatically these last twenty to thirty years, driven by unprecedented technological revolutions in communication and transportation. These changes have rapidly advanced our international economic integration, making the linkages between countries through international capital markets as important as the linkages through international trade, and monetary disturbances, which create large swings in exchange rates, as important or more important to U.S. agriculture than weather disturbances.

This changed world is not easy to understand, but we must make the effort. Part of that effort must be dedicated to sorting out where our true economic interests lie. The economic world is often not what it seems to be. We need to dig below the surface and try to identify and understand the underlying relationships.

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FARM ECONOMICS
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DEPARTMENT OF AGRICULTURAL ECONOMICS
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April 1987

87-5/Integrating Production and Marketing Decisions

The nature of agricultural production has changed in recent years. Increased volatility in grain prices, livestock prices, and interest rates have been important driving forces of change. Today's producers are larger, more efficient, and tend to view production as a year-round activity. Few seasonal producers remain because low returns in recent years have essentially forced significant capital investments and continuous production in order to survive.

As these changes have occurred, producer interest in marketing, and specifically reducing price risk, have increased. No longer is marketing viewed as simply the final step in the production process. The successful producers are taking a more business-oriented approach to marketing and considering marketing opportunities when the production decision is made. The key to the success of such a marketing strategy lies in the use of forward-pricing tools to lock in profits on expected production prior to making the production commitment.

This short article suggests an appropriate production-marketing horizon for agricultural producers, briefly examines the types of risks faced by producers and suggests methods for systematically evaluating these risks, and offers examples of these methods for grain and livestock production and marketing. The article concludes with remarks about the uses of these methods in managing the modern-day farming operation.

THE PRODUCTION-MARKETING HORIZON

Traditionally, production and marketing decisions were treated separately by grain and livestock producers. Grain was planted in the spring and harvested in the fall; marketing opportunities were examined only at harvest. Livestock producers often would breed and feed livestock seasonally, with little concern over marketing opportunities until the livestock approached market weight. The recent increases in price volatility are leading producers to seek alternative approaches to production and marketing decisions.

Increases in on-farm storage are emphasizing marketing of grain crops, as storage extends the selling period. Forward markets, including futures and options, for livestock are also being considered as a means of locking in profitable prices. Developing an appropriate production-marketing horizon is an essential first step in such a management plan.

The top portion of Figure 1 depicts the production and marketing horizon faced by the livestock producer. During the contemplation phase, the producer can rely on the price discovery function of futures markets to provide a daily consensus

Livestock Production-Marking Horizon

Figure 1. Production-Marketing horizon for livestock and grain.

estimate of the future value of expected production. When incorporated with accurate estimates of production costs, the producer can then evaluate the breeding decision, based on expected profitability when the hogs are sold. If the decision to breed is made, based on expected profits, the producer can then follow through and forward price the output to lock in the profit level, subject to changes in the (cash-futures) basis. We note, however, that locking in only the livestock price prior to placement still leaves the producer open to the risk of rising input costs, that is, corn and soybean meal. The producer may seek to use some sort of multiple hedging strategy to lock in both input and output prices, thereby locking in a profit margin.

Following the breeding decision, the producer can continue to monitor profit opportunities until placement. If a satisfactory profit level prior to placement has not been locked in, the animals can be placed on feed and the market monitored for profit opportunities during the feeding period. If the profit margin is realized while the livestock are being fed, a single hedge on the livestock is placed to lock in the margin. Research results suggest, however, that many of the best pricing opportunities often occur prior to placement.

A similar production-marketing horizon can be used by grain producers as shown in Figure 1. Decisions about planting intentions, crop mix, and other factors are made during the contemplation of planting phase, which follows the previous harvest. Following planting, the crop is monitored through the growth stage, and appropriate production and marketing strategies are evaluated. The crop is then either sold at harvest or stored for later sale. At all points along this production-marketing horizon the producer can take advantage of prices quoted in the futures market and the price outlook during the months to come to identify optimal selling opportunities. At this point measures of the probability of expected prices and yields can be integrated into the marketing plan. The next section briefly summarizes the concepts of using probabilities in production and marketing decision-making.

MEASURING RISK AND UNCERTAINTY IN AGRICULTURAL PRODUCTION

The preceding section alluded to the price-related risks faced by today's agricultural producer. In developing an integrated production and marketing strategy, input price risk, market price risk, and production risk all need to be considered. Because agricultural production processes are biological, they can be characterized by uncertainty or production risk. Success in planting and breeding, growing the crop, and achieving desired rates of grain all depend on a set of probabilities that the producer cannot completely control. Through good management, which incorporates an understanding of the types of risks faced, the producer can minimize the risks.

The Concept of Probabilities

Before discussing these risks, let us look at the concept of probability, an important way of evaluating risk. Probabilities are generally classified as either subjective or objective. Objective probabilities are computed from historical observations or data. Subjective probabilities are beliefs held by the decision maker about the degree of uncertainty of the occurrence of an event. Subjective probabilities usually vary among decision makers and over time as different information is available. Three major rules or axioms of probabilities can be defined as follows:

1. Probabilities must be in the range of 0 through 1.
2. The probability that two or more mutually exclusive events will occur is the sum of their respective probabilities.
3. The probability of the mutually exclusive and collectively exhaustive events must equal 1.

The first rule simply means that an event will not occur with certainty, will occur with certainty, or has some fractional chance (between 0 and 1) of occurring. An example of the second rule is that the probability of a swine producer producing hogs at a cost of $42 or $43/cwt equals the probability that the producer can produce hogs at $42/cwt plus the probability that the producer can produce hogs at $43/cwt. The third rule simply means that the sum of the probabilities of all ranges of production costs considered must equal 1.

Two Simple Methods

The conviction weights method and the triangular distribution method are two simple methods of developing estimates of probabilities. The conviction weights method involves subdividing the range of possible outcomes into intervals. The decision maker is then asked to weigh each interval relative to the conviction with which it is expected to occur.

An example of the conviction weights method is illustrated below. Based upon historical data, subjective beliefs, and other information, a decision maker can construct a probability distribution for hog prices as shown in Table 1. Six equal intervals are selected over the range of prices from $35 to $70/cwt. The midpoint is calculated for each interval, and the decision maker assigns a weight based on the belief that hog prices will fall in that interval. The weights for each interval are then summed, and the weight for each interval is divided by the sum to obtain the decision maker's personal probability for each interval. The final step is to multiply the midpoints of each interval by the personal probabilities, whose sum will equal the mean price.

The triangular distribution method is another method of developing a subjective probability distribution. This method has the decision maker define three points of the distribution of possible outomes: the lower and the upper endpoints and the mode (most likely point). In other words, the decision maker specifies the "lowest possible," "highest possible," and "most likely" outcomes for the uncertain event. Figure 2 shows a triangular distribution for corn prices constructed using a low price of $1.30/bu, a high price of $2.80/bu, and a mode price of $1.75/bu. The mean or expected price can be calculated as the sum of the low (L), high (H), and mode (M) prices divided by 3.

Table 1. Conviction Weights Methods for Calculating Subjective Hog Prices

Price Interval	Price Midpoint	Weights	Personal probability	Midpoint times probability
35 ≤ 40	37.5	10	.05	1.875
40 ≤ 45	42.5	30	.15	6.375
45 ≤ 50	47.5	40	.20	9.5
50 ≤ 55	52.5	80	.40	21.0
55 ≤ 60	57.5	25	.125	7.1875
60 ≤ 65	62.5	10	.05	3.125
65 ≤ 70	67.5	5	.025	1.6875
Total weights		200	Mean price	50.75

Figure 2. Triangular distribution for corn prices.

Although the triangular distribution method requires less information than the conviction weights method, the probabilities are more difficult to compute. However, they can readily be calculated on a hand calculator or with a microcomputer. The graph provides a general representation of probabilities, but the actual probability of a price (P_I) being less than some level is calculated with one of the following two formulas:

1. Probability = $(P_i - L)^2 / (H - L)(M - L)$ for $P_i \leq$ the mode
2. Probability = $1.0 - (P_i - H)^2 / (H - L)(H - M)$ for $P_i >$ the mode

Using the first formula, we can readily calculate the probability of a price less than or equal to the mode as 0.3, as shown in Figure 2.

Probability = $(1.75 - 1.30)^2 / (2.80 - 1.30)(1.75 - 1.30) = 0.3$

A method of eliciting subjective probabilities, such as one of the two described above, can also estimate distributions for production, production costs, and input prices. Historical data will be much more valuable for obtaining probabilities of cost of production.

An Example

If the decision maker knows production costs and has a subjective estimate of prices, he or she can then set some rules for production and marketing decisions. For example, let us assume that the subjective probability for production costs tell him or her that there is an 80 percent chance (.80 probability) feeder pigs can be produced for $47.50/cwt or less. From the example in Table 1 we see that the decision maker believes there is 60 percent chance of locking in a market price above $50/cwt. If we assume that production costs are independent of market prices, four scenarios and their subjective probabilities exist:

1.	Cost $\leq$ \$47.5 and Price $<$ \$50.0	.80 times .60 = .48
2.	Cost $\leq$ \$47.5 and Price $\leq$ \$50.0	.80 times .40 = .32
3.	Cost $<$ \$47.5 and Price $\leq$ \$50.0	.80 times .40 = .08
4.	Cost $<$ \$47.5 and Price $<$ \$50.0	.80 times .60 = .12

From this example we see that the probability of market prices above $50/cwt and costs below $47.50/cwt is 48 percent. Thus, we have subjectively estimated, with a probability of .48, that we can lock in a profit of at least $1.50/cwt before the beginning of our production period. The decision maker then may develop a rule to lock in this profit margin on, say, 30 percent of production whenever possible, and design a pricing strategy that scales up the position as prices improve.

We can also use the same type of information for corn production and marketing. Corn prices, less government payments, may be expected to be distributed as in Figure 2. The probability that the price will be below $2.00/bu is calculated as follows:

$$\text{Probability} = 1.0 - (2.0 - 2.8)^2 / (2.8 - 1.3)(2.8 - 1.8) = .5733$$

The chance of receiving a price above $2.00/bu is therefore about 42.7 percent (1 - .573). A subjective estimate of per bushel production costs can be calculated, based on historical yield and cost information, as well as information on future input costs. With this information the decision maker's subjection probabilities may indicate only a 20 percent chance that total per bushel production costs will fall below $2.00. In this case the producer has only a probability of .085 (.20 x .427) of covering the cost of production. A preplanting decision would then be to participate in the government set-aside program with an expected deficiency payment of approximately $1.20/bu.

Similar analyses can be performed to estimate and control input costs. We note that the goal of the decision maker, who wishes to manage risk, should not be to sell at the highest price, but to control input costs and insure a profit on as many units as possible.

CONCLUDING REMARKS

Integrating production and marketing decisions using probabilities has been shown as a means of managing or controlling risk. Although risk is often thought of as a

negative factor, it should be considered as an opportunity. Risk allows good managers to take advantage of price and output changes. The key is to manage risk in the context of the goals of the producer and the particular production process.

A decision maker who has an understanding of the variability of physical production and volatility of input and output prices has more information to make both production and marketing decisions. The effective management of the swine industry may often lock in a profit before production commitments are made. The use of forward-pricing tools and the integration of probabilities into the planning process deserve serious consideration in today's changing agricultural environment.

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April 1987

87-6/The Cost of Growing Corn and Soybeans, 1986

In 1986, the total cost per acre for growing corn in Illinois averaged $362 in the northern section, $368 in the central section with the higher soil ratings, $332 in the central section with the lower soil ratings, and $268 in the southern section. The soybean costs per acre were $285, $287, $256, and $213, respectively. The total crop costs per acre were lower in southern Illinois because that region, as the accompanying table indicates, has the lowest land cost in the state. The total costs per bushel ranged from $2.08 to $2.55 for corn and from $5.20 to $6.33 for soybeans. Variations in total costs were related to weather factors, yields, and the quality of the land.

These figures were obtained from Illinois Farm Business Records that are kept by farmers enrolled in the Illinois Farm Business Farm Management Association. The samples included only farms of more than 260 acres on the more productive and nearly level soils in each area of the state; these farms are without livestock. Farms located in 22 counties north and northwest of the Illinois River are included in the sample for northern Illinois. Farms from 36 counties below a line from about Mattoon to Alton are in the sample for southern Illinois. The remaining 44 counties make up the sample for central Illinois. The sample farms averaged 612 tillable acres in northern Illinois, 642 acres in the central section with high soil ratings, 669 acres in the central section with lower soil ratings, and 850 acres in southern Illinois.

This summary includes some factors that farmers, unlike some other sole-proprietor businesses, consider the cost of doing business. These factors are not used as expense items on income tax returns. Examples include the charge for labor on work done by the farm operator, a rental charge for the use of owned and rented land, and an interest charge on equity in the inventories.

NONLAND COSTS

For soybeans, soil-fertility costs were allocated on the basis of phosphorus, potassium, and lime removals, with the residual cost allocated to corn. The seed, crop, chemical, and drying expenses also included some commercial drying and storage and the estimated value of home-raised seed. The costs of fuel, machine hire, and repairing machinery were reduced for income received from custom work.

Costs Per Acre for Growing Corn and Soybeans in 19865 on Illinois Grain Farms with No Livestock

	Corn				Soybeans			
	North	Central[a]	Central[b]	South	North	Central[a]	Central[b]	South
Number of farms	261	543	272	242	261	543	272	242
Acres in crop	310	285	300	309	213	278	286	344
NONLAND COSTS								
Variable costs:								
Soil fertility	$ 49	$ 51	$ 48	$ 45	$ 16	$ 17	$ 16	$ 15
Pesticides	21	19	18	19	20	18	18	18
Seed	22	22	21	18	12	13	12	12
Drying and storage	19	21	19	6	6	4	4	2
Repairs, fuel, and hire	30	28	27	30	25	24	24	26
Total, variable costs	$141	$141	$133	$118	$ 79	$ 76	$ 74	$ 73
Percent change from 1985	-3	-3	-5	-10	3	-5	-4	-5
Other nonland costs:								
Labor	$ 29	$ 31	$ 30	$ 27	$ 28	$ 28	$ 27	$ 26
Buildings and storage	15	9	10	9	10	5	5	5
Machinery depreciation	30	30	25	27	24	24	20	23
Nonland interest	29	29	25	15	26	26	21	14
Overhead	12	11	12	9	12	11	12	9
Total, other costs	$115	$110	$102	$ 87	$100	$ 94	$ 85	$ 77
Total, nonland costs	$256	$251	$235	$205	$179	$170	$159	$150
Percent change from 1985	-6	-4	-7	-10	-4	-6	-6	-7
LAND COSTS								
Taxes	$ 19	$ 21	$ 17	$ 9	$ 19	$ 21	$ 17	$ 9
Annually adjusted net rent	87	96	80	54	87	96	80	54
Total land cost	$106	$117	$ 97	$ 63	$106	$117	$ 97	$ 63
TOTAL, ALL COSTS	$362	$368	$332	$268	$285	$287	$256	$213
Percent change from 1985	-4	-3	-5	-8	-2	-3	-4	-5
1986 yields, bushels per acre	142	165	140	129	45	49	42	41
Nonland cost per bushel	$1.80	$1.52	$1.68	$1.59	$3.98	$3.47	$3.79	$3.66
Total, all costs per bushel	$2.55	$2.23	$2.37	$2.08	$6.33	$5.86	$6.10	$5.20
Average yield for 1983-1986	132	143	122	102	43	45	41	33
Nonland cost per bushel	$1.94	$1.76	$1.93	$2.01	$4.16	$3.78	$3.88	$4.55
Total, all costs per bushel	$2.74	$2.57	$2.72	$2.63	$6.63	$6.38	$6.24	$6.45

NOTE: Below the dashed line, the entries are costs based on average yields for the period from 1983 to 1986.
[a] Soil productivity ratings of 86-100.
[b] Soil productivity ratings of 56-85.

The labor costs included the cash value of hired labor, plus a charge for available operator labor at a rate of $1,150 per month. The building and storage costs used were for repairs and depreciation only. The nonland interest charge in 1986 was ten percent on the average of half the inventory value of crops at the beginning and end of the year, plus the depreciated value of machinery and buildings, plus half the total operating expenses. Overhead costs included insurance, utilities, the farm share of automobile expenses, and miscellaneous items. No charge has been made in this analysis for management. This charge might normally be about five percent of the total cost per bushel: ten to fifteen cents per bushel for corn and twenty-five to thirty cents per bushel for soybeans.

LAND COSTS

These costs included the adjusted net rent and the real estate taxes. Net rent was represented as the average received by crop-share landlords as reported on record-keeping farms for the four-year period from 1982 to 1985. Caution is needed in interpreting differences in land costs between areas. In the long run, the changes in the net rent residual return to landowners should tend to equalize the total costs of production between areas.

COST PER BUSHEL

Production costs per bushel of corn increased slightly in 1986 from 1985 in all areas of the state except for southern Illinois. Although total costs decreased three to eight percent, yields in central and northern Illinois were also lower from the record levels of 1985, resulting in higher costs of production. Corn yields in southern Illinois increased fourteen bushels per acre compared to 1985. Corn yields in central and northern Illinois were six to fifteen bushels per acre lower. Overall, corn yields were still from ten to twenty-seven bushels per acre higher than the average for the period from 1983 to 1986.

Production costs per bushel of soybeans increased in 1986 from 1985 in all areas of the state except for southern Illinois. Total costs decreased two to five percent, while yields decreased two to nine bushels per acre in the northern and central sections. Soybean yields increased three bushels per acre in southern Illinois. With the lower costs, this increase resulted in a 69-cent per bushel drop in the cost of production. Soybean yields were from one to eight bushels per acre higher than the average for the period from 1983 to 1986.

Current corn and soybean selling prices continue to stay below the average total cost of production, using 1986 total costs and average yields for the period from 1983 to 1986. For an owner-operator with these yields, it would take from $.99 to $1.16 a bushel for corn, and from $1.69 to $2.21 a bushel for soybeans to cover the variable costs listed in the table. But to recover total costs, it would take from $2.57 to $2.74 a bushel for corn and from $6.24 to $6.63 a bushel for soybeans. In 1986, yields in many parts of the state were only slightly below the record yields set in 1985. Yields in southern Illinois were higher in 1986 than in 1985. Even with these good yields, the total cost of production was above the market price for corn and soybeans. Looking ahead, projected market prices are considerably lower than the total cost of production, based on average yields for the period from 1983 to 1986. Producers are planning on participating in the 1987 Feed Grain Program to a high degree. This participation will provide producers with a certain level of price support for feed grains. There will continue to be pressure, however, to adjust production costs where possible. There could continue

to be downward pressure on land values and cash rent because land is the residual claimant of returns over the most relevant costs.

To compute the break-even cost per bushel for growing corn and soybeans, individual tenants and landowners need to divide the costs and yields shown in the table as they are shared by the terms of the lease. As land values drop, the charge for the use of land tends to drop until the total production costs of corn and soybeans are in line with expected price levels.

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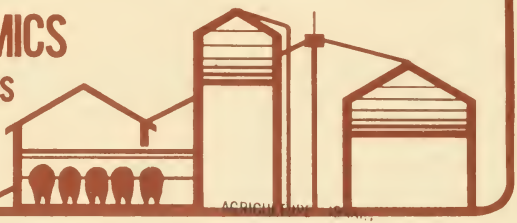

April 1987

87-7/Tillage Methods and Crop Residue Levels

Concern with soil erosion has placed great emphasis on changing tillage methods so that more crop residue will be left on the field. Farmers have indicated that they are supportive of the need to reduce soil erosion and that they are aware that many changes have been made in tillage practices. However, the new tillage practices are not well defined and there is much uncertainty among farmers about the effectiveness of their actions in maintaining residue cover and reducing soil erosion.

In this report we present results from research on farmer estimates of residue levels. The research was conducted in the fall of 1985 and the spring of 1986, involving personal interviews and the taking of field measurements for a sample of farmers located throughout Illinois. Farmers were asked to describe their cropping and tillage practices, and to give an estimate of the percent residue cover for one particular field. Following the interviews, four residue cover measurements were taken in that same field using the line-transect ("rope") method. These paired sets of farmer-field data were collected by fourteen groups of trained Future Farmers of America (FFA) teachers with their students, and three trained farmers.

The research in the fall of 1985 took place at a time when the farmers had completed their harvest and had not yet begun their spring tillage. The fall of 1985 was particularly wet, preventing many farmers from carrying out field work they might have contemplated for the fall. As a result, residue levels in the fall of 1985 were generally quite high.

After the spring 1986 crop had been planted, data were obtained once again on farmer estimates and field measurement of residue levels for the same field that had been measured in the spring. A total of 75 farmers and their fields from the 93 in the fall survey were surveyed again. The attrition of eighteen cases was due mainly to lack of cooperation by some FFA chapters or occasionally because farmers refused to be interviewed a second time. Because of requirements to obtain paired sets of farmer estimates and field data for both fall and spring, a total of 67 sets of data was sufficiently complete to be analyzed.

Although there was a loss of 29 cases from the fall 1985 sample, the farmers and farm fields resampled in the spring of 1986 were considered to be representative of

the fall sample. A majority of the fields were in corn or soybeans (72 percent); the remainder were in hay or small grain. This is comparable to the fall sample, in which 74 percent of the farms were corn and soybean, and 26 percent were hay and small grain.

In Figure 1 we characterize farmers according to the tillage practices they reported. Two-thirds of the farmers performed no fall tillage, while the other third disked, chisel plowed, moldboard plowed, or field cultivated. While the fall data would indicate a rather high occurrence of "no-till" farmers, we found that many had not been able to get into the fields during the fall of 1985 to perform their intended tillage because of wet field conditions, or deliberately delaying their tillage to the next spring. Figure 1 indicates that after planting the next spring, only 10 percent of the respondents have not carried out some type of field work. In the spring, 60 percent of the farmers disked their fields, a practice that has largely replaced moldboard plowing and is frequently equated with "conservation tillage."

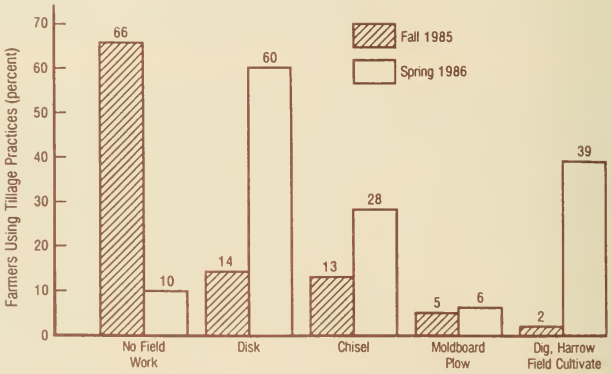

Figure 1. Tillage Practices Used by Farmers in Fall 1985 and Spring 1986.

As Figure 2 indicates, there is a substantial decrease in residue levels after spring field work has been completed. For all fields in the study, the average percentage of residue coverage was reduced by 30 percent. However, these reductions are more substantial for soybean and corn fields, where the average residue cover after planting is around 25 percent; for many individual fields the coverage is much lower.

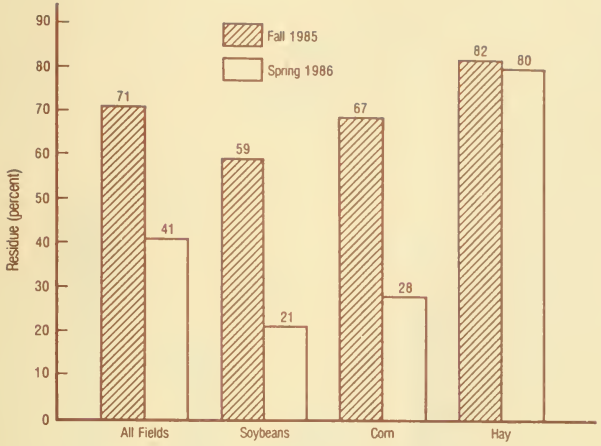

Figure 2. Average Field Measured Residue Level by Crop.

We were concerned with knowing how well farmers knew the conditions of their fields. Therefore, we asked farmers to estimate the residue levels in their fields. If farmers' estimates were within 10 percent of the value measured in the field, we declared their estimates to be "accurate." The fall estimates were more likely to be accurate than the spring estimates. The reason for this can be seen in Figure 3. Because many farmers had not been able to do field work in the fall, residue levels were higher on many fields and estimates were found to be more accurate. In the spring, few fields had high levels of residue and, in general, the estimates were much less accurate.

The relationship between the residue level and the farmer's ability to accurately estimate is especially important because at lower levels of residue, when farmers make the least accurate estimates, the greatest gains in erosion control are found for small increases in residue cover. Other analyses, not shown here, indicate that those farmers who have the lowest residue levels on their fields are most likely to *overestimate* the residue levels. The fact that they overestimate means that if soil erosion values are estimated from these reported values, the amount of annual soil loss due to erosion is considerably underestimated. Thus, misjudgments of residue levels at the lower levels of cover may give farmers seriously misleading ideas on how well they are controlling soil erosion.

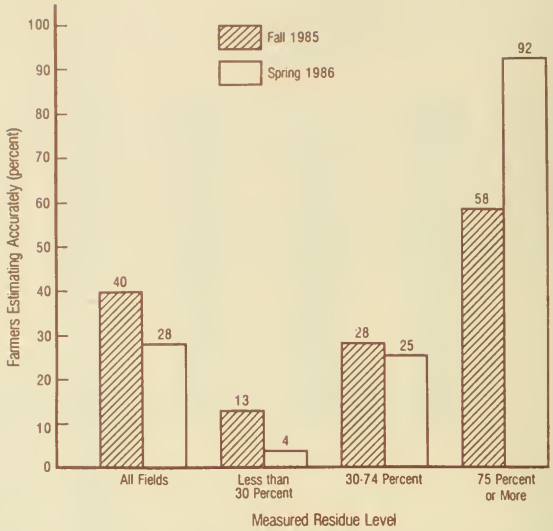

Figure 3. Percent of Farmers Estimating Accurately by Measured Level of Residue.

Finally, Figure 4 illustrates in a different way the troubles farmers have in accurately estimating the residue left in their fields after fall and/or spring tillage operations. Nearly half (43 percent) of the farmers did not accurately estimate in either the spring or the fall, and only 16 percent of the farmers accurately estimated on both occasions.

The present analysis indicates that farmers' residue estimates are quite unreliable, especially at the lower levels of residue. These findings are of concern in light of the considerable effort that has been made by the Cooperative Extension Service, the Soil Conservation Service, and Soil and Water Conservation Districts to familiarize farmers with the need to maintain adequate cover on their fields. The concept of residue cover, as associated with different tillage systems, is relatively new to most farmers, and the data indicate their inexperience with the concepts associated with tillage systems. Other research also indicates that, although a considerable effort has been made in Illinois to acquaint farmers with ways to do the necessary measurements to calculate USLE values, very few farmers actually carry out such field measurements. As a result, farmers are not in a position to compare their estimates with actual field measurements and therefore, they are unable to improve their skills at judging residue levels.

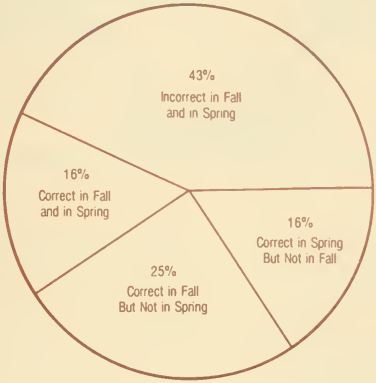

Figure 4. Consistency of Farmers' Residue Estimates in Fall 1985 and Spring 1986.

The results have implications for farmers' abilities to make decisions to use soil conservation practices on their fields. Especially those farmers using tillage systems--or growing crops--that leave low levels of residue; they are likely to overestimate the residue levels and underestimate the amount of soil loss on their fields. Given the necessity for many farmers to develop farm conservation plans in order to comply with provisions of Title XII of the 1985 Food Security Act, this lack of ability by farmers to make judgments on the potential for erosion on their own fields will make the construction of plans and their implementation more difficult.

This report was prepared by J.C. van Es, Professor of Rural Sociology and E.H. Makowski, Graduate Student in Geography. The research is supported in part by the Monsanto Corporation and the Institute of Environmental Studies at the University of Illinois, Urbana-Champaign. The researchers wish to thank the fourteen Future Farmers of America (FFA) chapters and the individual farmers throughout Illinois who participated in the data collection.

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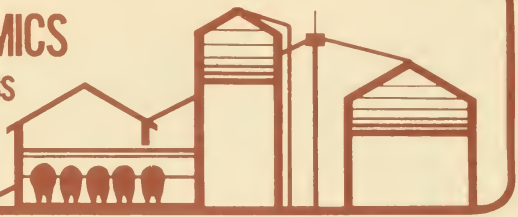

June 1987

87-8/The Financial Position of Illinois Farm Operations and Cost and Returns from Crop and Livestock Enterprises

STABLE NET INCOMES RESULT IN SMALL CHANGE IN NET WORTH

Data on net farm income, as summarized from records kept by farmers enrolled in the Illinois Farm Business Farm Management Association (FBFM) record-keeping program, can be used to estimate changes in net worth. On a cost basis, without considering inflation or deflation of capital asset values, the change is calculated by adding net farm and net nonfarm income (Table 1) and then subtracting withdrawals for family living and for income and Social Security taxes. Using this procedure, the net worth of the average Illincis farm operator declined by $4,174 in 1983, dropped another $10,551 in 1984, increased by $2,333 in 1985, and increased $2,075 in 1986.

The total decline in net worth on a balance sheet based on fair market value would be much greater if that decline were to include the change in land values during the period from 1983 to 1986; changes in net worth would vary greatly among farms and areas in the state. This report is based on a summary of 3,531 Illinois farm business records that are kept in cooperation with the Illinois FBFM Association and the Illinois Cooperative Extension Service.

Net farm income is the accrued value of the operator's share of farm production less total operating expenses, including the amount of interest paid and depreciation, plus gain or loss on machinery or buildings sold. Net farm income added to net nonfarm income is the income available to pay for family living expenses and income and Social Security taxes. Total net income is also the source of income used to pay the principal on long-term debt, to invest into savings, or for both purposes. Estimates used in Table 1 for net nonfarm income and withdrawals for living expenses and taxes were based on a sample of 285 central Illinois farm families. These families balanced all sources of farm and nonfarm funds with the uses of funds to identify precise expenditures for these withdrawals. These expenditures were then adjusted downward by 10 percent to reflect the larger-than-average farms in central Illinois.

CAPACITY FOR REPAYMENT OF CAPITAL DEBT

The average funds available for repayment of capital debt per farm family for all 3,531 farm operators was estimated at $20,152 in 1983, $13,851 in 1984, $26,136 in

1985, and $23,376 in 1986 (Table 1). Each amount, respectively, was the funds estimated to be available that year for capital purchases and principal payments or long-term debt. The table shows actual dollar commitments per farm that were made for capital purchases of machinery, equipment, or buildings. Note that in 1983 these commitments would have almost depleted all of these funds, and in 1984 these commitments were greater than funds available for capital debt repayment. Improvement was made in 1985 and 1986, with the amount of capital purchases less than the funds available for capital debt repayment. For the period from 1983 to 1986, 1985 was the year in which capital purchases were lowest and funds available for repayment of capital debt the highest. As a result, the more funds were available in 1985 for repayment of long-term debt than in other years during this four-year period. When commitments to capital purchases deplete all of the funds available for repayment of long-term debt, the average farm with long-term debt repayments would probably borrow funds to finance the new capital purchases, as long as there is adequate collateral in the business.

The records show that funds available for repayment of debts have varied greatly among areas in the state. Estimated changes in net worth in 1986 were positive for central and western Illinois and negative for eastern, northern, and southernmost Illinois. Western and southern Illinois showed positive changes in net worth as compared to 1985.

Table 1. Estimated Change in Net Worth and Capacity for Repayment of Capital Debt for 3,531 Illinois Farm Operators

	All Illinois counties			
	1983	1984	1985	1986
Net farm income	$16,627	$ 8,624	$22,037	$21,575
+ Net nonfarm income[a]	6,873	9,208	8,721	8,500
- Family living expenses[b]	23,845	24,042	24,503	24,000
- Income and Social Security taxes[b]	3,829	4,341	3,922	4,000
Change in net worth	$-4,174	$-10,551	$ 2,333	$ 2,075
+ Depreciation	24,326	24,402	23,803	21,301
Funds available for capital debt repayment	$20,152	$13,851	$26,136	$23,376
Capital purchases	$19,325	$15,741	$13,875	$14,674
Cash interest paid	$19,127	$18,491	$18,863	$17,107

[a]Actual amounts identified from a central Illinois sample of 285 farms for 1983, 1984, and 1985; amounts for 1986 are estimated.
[b]Actual amounts identified from a central Illinois sample of 285 farms for 1983, 1984, and 1985--reduced by 10 percent; amounts for 1986 are estimated.

INTEREST PAID AS A PERCENT OF GROSS

In 1985, 86 percent of the FBFM farm operators had positive net farm incomes, with cash interest payments less than 25 percent of the gross farm returns. The 14 percent of the operators with interest payments exceeding 25 percent of the gross had negative net farm incomes and could be expected to have problems with cash flow. The 5 percent paying more than 35 percent of the gross for interest had negative net farm incomes averaging $26,242 per farm. This last group could be expected to have difficulty maintaining a farm business without nonfarm income. The percentage of operators having negative farm incomes in 1986 will be similar to

that of 1985. The average operator's net farm income dropped slightly in 1986 as compared to 1985; incomes, however, varied substantially between different areas of the state and among types of farms. The largest increase in incomes occurred in western and southern Illinois and on hog farms. Incomes decreased on grain farms, most noticeably in central and east-central Illinois. Operators' net farm incomes were highest in the western, west-central, and south-central areas of Illinois.

COST AND RETURNS FROM CROPS

Corn and soybeans are crops that make important contributions to net farm incomes and the current financial status of farm operators. See Figures 1 and 2 for the cost and return per bushel of both corn and soybeans produced each year from 1976 to 1986 on 500 central Illinois grain farms with high-quality soils and no livestock. In Figure 1, note that the total-cost line for growing a bushel of corn exceeded the average annual Illinois corn price line in six of the ten years since 1977. The difference between the total of all cost and the total nonland cost line is the charge for the use of land. The deficits indicate that profits (returns for risk and management) had to come from equities in capital, primarily land, or other unpaid inputs, such as operator labor or debt-free facilities. These low returns continue to bring down land values and force lower cash rents.

The variable-cost line reflects the total of cash expenditures for fertilizer, pesticides, seed, and drying--expenses that are normally shared according to the terms of the lease on rented farms--plus the cost of fuel, machine hire, and repairing machinery. Other nonland costs include labor, depreciation, interest, buildings, and overhead.

Total costs per acre in 1986 decreased slightly from costs in 1985. Lower yields on these farms resulted, however, in a slightly higher cost of production in 1986 than in 1985. Using the past four-year average corn yield of 143 bushels per acre, costs per bushel of corn produced are now averaging about $1.00 for the variable-cost line, $1.75 for the total nonland cost line, and $2.57 for the total-cost line.

Figure 2 shows the cost and return per bushel of soybeans produced on these same farms from 1976 to 1986. The total-cost line has exceeded returns as shown by the average annual price line each year since 1980 with the exception of 1985. This development reflects continued large soybean supplies and weak demand. With a normal yield of 45 bushels per acre, costs per bushel are now averaging about $1.70 for the variable cost, $3.78 for the total nonland costs, and $6.38 for the total costs. Total cost per bushel can be expected to go down as rent for the use of land goes down.

COSTS AND RETURNS FROM LIVESTOCK

Livestock also has been important to the current financial status of farm operators. Figure 3 shows the cost and returns per hundred pounds of pork produced annually from 1976 to 1986 on a sample of 89 farrow-to-finish enterprises with an average of 154 litters per year. Higher prices for pork and lower feed costs resulted in total returns exceeding total costs in 1986. The only other year since 1978 that total returns exceeded total costs was 1982. Average producers using large amounts of borrowed capital and hired labor would have found it difficult to survive since 1979 without utilizing savings, borrowing from equities in the crop enterprise, or borrowing from a lender.

Costs and Returns—Corn, Soybeans, and Pork

(Shade indicates a deficit below costs on all charts.)

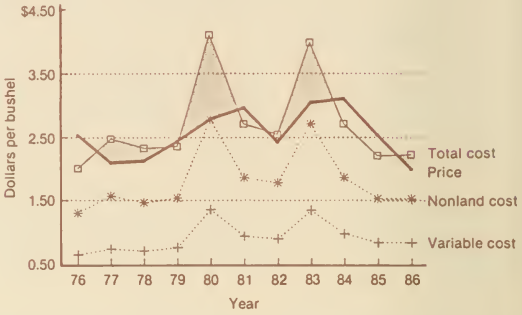

Figure 1. Cost and returns per bushel of corn produced on central Illinois grain farms from 1976 to 1986. Soil productivity rating, 86-100.

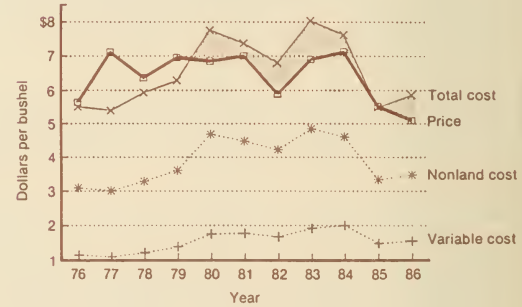

Figure 2. Cost and returns per bushel of soybeans produced on central Illinois grain farms from 1976 to 1986. Soil productivity rating, 86-100.

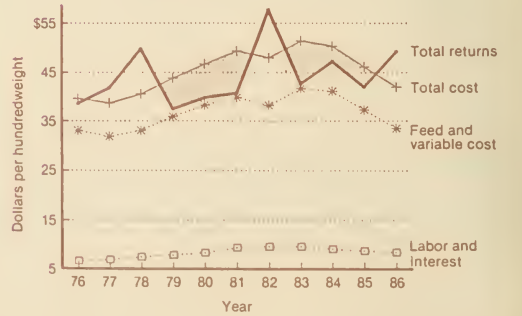

Figure 3. Cost and returns per hundred pounds of pork on farms with under 250 litters from 1976 to 1986.

Table 2 shows the average returns above the cost of feed and purchased animals from about 1,400 individual annual livestock enterprise records from 1982 to 1986. Returns above feed and purchased livestock is the amount available to pay for labor, machinery, equipment and building repairs, depreciation, livestock expense, taxes, overhead, and an interest charge on all capital used. There is no profit until these costs are covered. The two enterprises for which returns covered total costs the last five years were the farrow-to-finish hog and feeder-pig finishing enterprises.

Table 2. Returns above Cost of Feed and Purchased Animals to Livestock Enterprise Units from 1982 to 1986

Year	Farrow-to-finish hogs	Feeder-pig finishing	Feeder cattle	Dairy cattle	Beef herd[a]
	-----per hundredweight-----			*---per cow---*	
1982	$30.43	$16.40	$19.65	$1,043	$ 47
1983	12.68	5.26	16.04	885	51
1984	16.72	10.98	20.39	995	21
1985	16.71	7.00	8.86	1,054	5
1986	26.50	16.06	17.93	1,062	85
5-year average	$20.61	$11.14	$16.57	$1,008	42
Nonfeed costs, 1982-1986					
Direct cash	$ 6.40[c]	$ 4.00[b]	$12.50[c]	$ 350[c]	$ 30[b]
Other cost	12.35[c]	7.00[b]	15.85[c]	750[c]	185[b]
Total	$18.75	$11.00	$28.35	$1,100	$215

[a]The feed cost for beef herds includes up to $60 of hay equivalent from salvage roughage.
[b]Includes veterinary costs, utilities, fuel, equipment and building repair costs, depreciation, labor, and other nonfeed costs, including interest on feeder livestock, from Table 6, *Farm Management Manual*, 1982 to 1986.
[c]Estimates of annual nonfeed costs are based on enterprise cost studies of operative units from 1982 to 1985.

Based on the estimates of nonfeed costs in Table 2, the average returns above all costs from 1982 to 1986 for hogs (farrow-to-finish) was $20.61 (returns above feed and purchased animals) minus $18.75 (nonfeed costs), or a positive $1.86 per hundred pounds produced. For feeder-pig finishing enterprises, returns above all costs averaged $0.14 per one hundred pounds produced. Feeder cattle show returns per one hundred pounds produced that are $11.78 short of covering all costs; dairy returns averaged $92.00 per cow below all costs; whereas beef cow herds are $173.00 short per cow.

Although livestock returns improved in 1986, primarily due to lower feed costs, returns to management were still negative, with the exception of the hog enterprises. Lower feed costs, combined with strong prices for pork in the second half of the year, made 1986 a profitable year for pork producers. Livestock producers who use their own capital without borrowed funds have large amounts of

non-salable labor, feeds, or building space; and those producers who are more efficient than the average farmer have been in the best position to take advantage of the lower feed costs.

This report based on the summaries of Illinois farm business records reviews the financial status of Illinois farm operators over the past four years. Earnings th past two years have shown some improvement from the previous four years. Generall excellent yields, along with some basic income support provided by the Feed Grain Program, have been major reasons for this. Although earnings have improved, fundamental adjustments are taking place as the agricultural sector adjusts to relatively low returns. Selected costs have decreased. Land values have fallen 5 percent from their peak. The better managers operating in a good equity position have been able to survive the current economic pressures.

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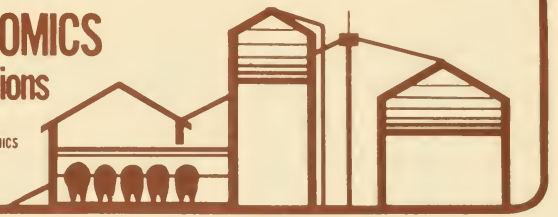

July 1987

87-9/Farm and Family Sources and Use of Dollars, 1983 to 1986, Illinois Farms

In 1986, the total, noncapital, family-living expenses of farm operators within a group of 324 record-keeping farms averaged $24,965, or $2,080 per month per family (Table 1). The farms were located primarily in central Illinois. This average was 3.0 percent higher than in 1985, 3.0 percent higher than in 1984, and 6.9 percent higher than in 1983. Another $3,777 was used to purchase capital items such as the personal share of the family automobile, furniture, and household equipment. Thus the grand total for living expenditures averaged $28,742 for 1986, compared with $27,226 for 1985, or a $1,516 increase per family. Expenditures for capital items increased $786 per family, while noncapital expenses increased $730 per family.

How these families use their funds depends somewhat on the levels of net farm and nonfarm incomes and the priority of the expenditure. In this sample, the 1986 net farm and net nonfarm incomes decreased slightly from 1985. The net farm income decreased $122 per farm and net nonfarm income decreased $195 per farm when compared to 1985. Most of the farms in the sample were classified as grain farms and were located in a 15-county area bounded by Jacksonville, Peoria, Champaign, and Mattoon. Although grain yields decreased slightly from the record levels of 1985, grain yields in 1986 were again excellent, with many corn yields averaging 155 to 170 bushels per acre.

The amount of interest paid per farm decreased from $22,144 in 1985 to $20,421 in 1986. Interest paid as a percent on farm receipts dropped from 14.1 percent in 1985 to 12.2 percent in 1986. As a percent of cash operating expenses, interest paid dropped from 18.6 percent in 1985 to 16.8 percent in 1986. Farm receipts per tillable acre increased $8; cash operating expenses, including interest, decreased $3. Interest payments per tillable acre decreased from $35 to $31, while noncapital living expenditures decreased from $39 to $38 per tillable acre. Machinery and building purchases increased somewhat, from $15,589 in 1985 to $16,603 in 1986.

Based on data recorded by the farmers and then edited by the Farm Business Farm Management (FBFM) Association field staff, the sample of farms showed an average debt of 63 cents for each $1 of farm assets as of December 31, 1986; machinery was valued on a cost-less-depreciation basis. The amount of debt for each $1 of assets was the same as a year earlier. Although the value of farm assets has declined, the amount of debt per farm also declined. This debt-to-asset ratio would be lower with machinery valued at a current market value. Including nonfarm assets would also lower the ratio.

Table 1. Average Farm and Family Sources and Uses of Dollars and Living Expenditures for 1983 through 1986 and by High and Low Noncapital Living Expenses

	All records, average per farm				Family of 3 to 5, 1986[a]	
	1986	1985	1984	1983	High-third	Low-third
Number in sample	324	313	286	257	72	72
Tillable acres farmed	651	629	602	601	757	561
Acres owned	124	119	112	128	148	120
Farm assets, January 1[b]	$350,114	$368,344	$411,320	...[c]	$423,649	$289,884
Farm assets, December 31[b]	335,180	374,126	402,024	...[c]	404,398	281,194
Liabilities, January 1	223,214	220,968	212,048	$227,749	254,452	188,877
Liabilities, December 31	212,064	234,155	219,049	223,757	245,303	178,476
Net farm income	25,555	25,677	13,573	...[c]	31,807	19,225
Source of Dollars						
Net nonfarm income	$ 8,526	$ 8,721	$ 9,208	$ 6,873	$ 8,222	$ 7,260
Money borrowed	123,445	137,065	96,895	81,460	141,111	112,822
Farm receipts	$167,938	$157,042	$146,213	$148,671	$199,709	$142,184
Uses of Dollars						
Interest paid	$ 20,421	$ 22,144	$ 20,651	$ 22,812	$ 23,530	$ 17,716
Cash operating expenses	100,983	96,761	90,621	84,680	119,383	89,515
Capital farm purchases	16,603	15,589	15,871	15,338	19,923	15,205
Payments on principal	134,604	123,430	90,191	85,006	148,988	123,651
Income and Social Security taxes	3,762	4,358	4,823	4,255	4,948	2,083
Net new savings and investment.	-5,206	13,320	3,446	-1,582	-5,571	-6,759
Living Expenses						
Contributions	$ 1,236	$ 1,145	$ 1,121	$ 1,154	$ 1,979	$ 774
Medical	3,226	3,146	3,126	2,774	3,673	2,575
Insurance, life and disability.	2,139	2,209	2,197	2,104	3,052	1,159
Expendables	18,364	17,735	17,803	17,303	25,722	13,426
Total noncapital expense	(24,965)	(24,235)	(24,247)	(23,335)	(34,426)	(17,934)
Capital	3,777	2,991	2,466	3,160	3,395	2,893
Total, living expenses	$ 28,742	$ 27,226	$ 26,713	$ 26,495	$ 37,821	$ 20,827
Total noncapital living expenses, percent change	3.0	0.0	3.9	4.6	...	...

[a] Records were sorted into high- and low-third categories according to total noncapital living expenses.
[b] Modified cost basis except bare land values were held at current values between January 1 and December 31.
[c] Data not available.

The farms in this sample were 73 acres larger than the average for the 7,500 farms in the FBFM program. Crop yields averaged about 5 percent above those reported by the Illinois Crop Reporting Service. These factors, combined with the fact that the area sampled had the highest corn yields in Illinois in 1986, resulted in the net farm income averaging $3,980 above the average of all Illinois record-keeping farms. As long as this income level persists, average living expenditures for farms in this sample are estimated to be 15 to 20 percent above the average of all Illinois farm operators having more than $40,000 gross sales per farm.

In 1986 the operators of these 324 farms averaged 43 years of age. The family averaged 3.6 members, with the age of the oldest dependent child being 9 years. The average operator farmed 651 tillable acres and owned 124 of these acres (19 percent of this land). The operators kept records so that all sources of funds, both farm and nonfarm, balanced with all uses of funds in a complete monthly cash-flow accounting system.

In the table, the averages per farm for total family living expenses are divided into five categories for 1983 through 1986. The "expendables" category includes cash spent for food, operating expenses, clothing, personal items, recreation, entertainment, education, and transportation. Cash spent for capital improvements exceeding $250 is not included. The use of a rented house on an estimated 40 to 50 percent of the farms in this sample is not included, because these data cover only cash outlays.

The excess on nonfarm taxable income over nonfarm business expense was $8,526 in 1986, or 30 percent of the total living expense; in 1985 the excess was 32 percent. Nonfarm income includes dividends on stocks, interest on savings and money-market funds, income from other nonfarm investments, and income from off-farm labor performed by family members. Interest earned and left in savings accounts not included in the cash flow is not reflected in the nonfarm income.

While the value of farm assets for this sample of 324 farms continues to decline, the amount of liabilities also decreased when compared to a year earlier. The value of farm assets on December 31, 1986, was $38,946 less than a year earlier. The decline reflects the continued drop in land values. At the same time, liabilities decreased by $22,091. These farms borrowed $13,620 less and made $11,174 more principal payments than a year earlier. The $16,603, or $26 per tillable acre, spent on capital purchases for machinery and equipment remained at about one-half the level of capital purchases common before 1980.

Although interest payments continue to be one of the highest farm expense items, declines in interest paid did occur. Interest includes that paid on operating, intermediate, and real estate debt. Interest paid increased from 12 percent of total farm operating expense in 1979 to 21 percent in 1983 and dropped to 17 percent in 1986. The $20,421 interest payment in 1986 was 12 percent of total cash farm receipts, down from 14 percent in 1985.

The records from farm families with three to five persons were sorted into two categories, the high-third and the low-third, according to their noncapital living expenses. The total living expenses for the high-third group averaged $37,821, compared with $20,827 for the low-third group. The high-third group farmed 196 more acres than the other group and owned 20 percent of the land farmed; the low-third group owned 21 percent of the land farmed. The larger farms in the first group had more income for living expenses and income tax. Net farm plus nonfarm income was $40,029 for the high-third group compared with $26,485 for the low-third

group. The average age of operators in the high-third group was 42 and the number of family members was 4.2, compared with 39 years of age and 3.9 family members fo the other group.

Projected for the next few years are low commodity prices, which result in narrow profit margins that require farm operators to closely monitor all receipts and expenditures. It is therefore important that more farmers learn how to balance an monitor their cash flow each month. Computer program assistance is now becoming available in more service centers, such as some FBFM district offices. These centers are prepared to offer services to help farmers project monthly cash flow o computer printouts so that they can compare projections to their actual results.

For the farm operators with low equity or very high debt-to-asset ratios, this typ of accounting is essential. These operators need to account for all of their sources and uses of funds to assist them in making sound financial management decisions.

The data summarized in this process may also serve as a guide in budgeting allowances for family living expenses. For families in this sample, the family living expenses totaled $44 for each tillable acre farmed. If the net nonfarm income of $13 per tillable acre is used for living, $31 per tillable acre will have to be generated from the farm business to meet family living requirements. Each family must determine how much each acre of crop or each litter of hogs should contribute to their family living. This amount, when added to production costs and other obligations, can help to determine break-even prices needed for products sold.

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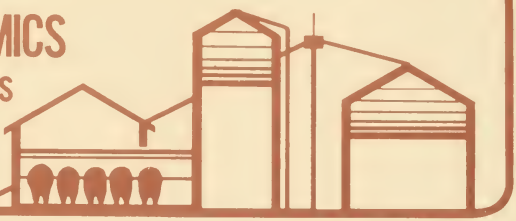

87-10/Illinois Farm Property Taxes and The Continuing Farm Property Tax Parad

Property tax relief was raised again in the Illinois General Assembly this summer as debate over Governor Thompson's proposed state tax increases began losing momentum. Agricultural interests and interests from suburban Chicago placed property tax relief on the table during tax increase discussions. Property tax relief continues to be a policy issue for agriculture because of the relatively heavy burden of property taxes on agriculture as compared to agricultural incomes.

The weakened condition of the farm economy in the 1980s has placed downward pressure on the Illinois farm property tax base putting the budgets of rural schools and other rural governments at risk. Since 1981, the taxable value of farm real estate in Illinois (outside Cook County) has declined 21 percent. In some counties, lower assessments have resulted in lower average per acre taxes. In other areas, tax rates have increased to offset any reductions in assessed values resulting in limited reductions in per acre farm property taxes. The average tax rate on farm property increased 17 percent between 1981 and 1985. The average in 1985 (the most recent year with complete data) was 5.52 percent.

The reversal of the long-standing trend of ever increasing property taxes on Illinois farmland that began in 1984, continued in 1986. Property taxes on Illinois grain farms declined an average of 43 cents per acre, from $15.14 per acre in 1985, to $14.71 per acre in 1986. Since their peak in 1983, average per acre taxes have declined $1.04.

The per acre property taxes for a sample of Illinois grain farms for 1975 to 1986 are shown in Figure 1a. Data for the sample farms in the 68 northern and central Illinois counties and the 34 southern Illinois counties are also included (Figures 1b and 1c). In 1986, the sample included 2,046 grain farms, which totaled 1.5 million acres of land. Higher building assessments on some livestock farms will result in higher per acre taxes than those presented in Figures 1a, 1b, and 1c.

The historical difference between per acre taxes in southern Illinois and those in northern and central Illinois continues. The 1986 per acre property taxes on northern and central Illinois grain farms were $18.49, compared to an average of $8.72 reported for southern Illinois. Historically, property taxes on northern Illinois farms have been about double the level of taxes on southern Illinois farms. This difference reflects, in part, different soil productivity between the two parts of the state.

Figure 1a. Per acre property taxes on Illinois grain farms, 1975 to 1986.

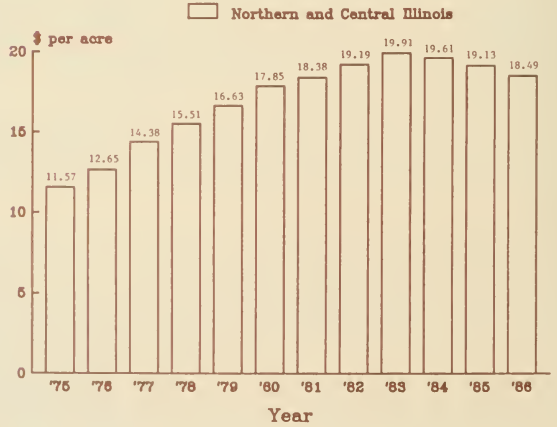

Figure 1b. Per acre property taxes on northern and central Illinois grain farms, 1975 to 1986.

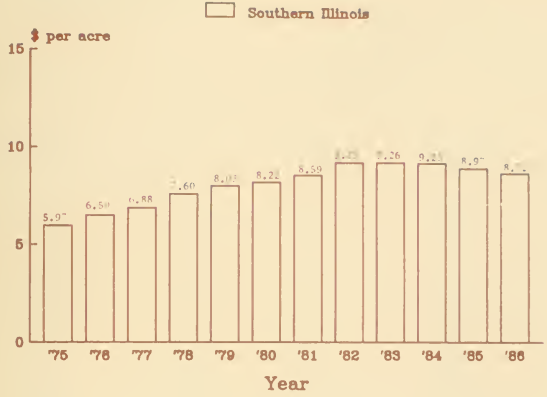

Figure 1c. Per acre property taxes on southern Illinois grain farms, 1975 to 1986.

Although lower taxes may be a welcome change for farmland owners, reduced property tax revenues are placing fiscal pressures on rural schools, townships, road districts, and county governments. Lower property tax revenues will eventually force rural government spending down unless revenues from other sources are found Counties, townships, and road districts are also having to adjust to the loss of federal revenue sharing while rural schools stand to lose state school aid because taxes were not increased by the General Assembly. The culmination of forces will severely stress the financial position of some rural schools, townships, road districts, and counties.

EFFECTIVE TAX RATES AND THE CONTINUING FARM PROPERTY TAX PARADOX

One way to measure the property tax burden on Illinois farms is to use the effective property tax rate that compares property taxes to land values. These rates for the last twelve years are presented in Table 1. Between 1981 and 1986, effective tax rates for Illinois farmland increased 91 percent (from 0.56 percent to 1.07 percent). This increase reflects slightly lower property taxes combined with a substantial reduction in Illinois farmland values. Without significantly larger reductions in per acre property taxes, the effective tax rate for Illinois farmland can be expected to continue to climb over the next few years

The rate at which per acre taxes have declined since 1983 will not significantly reverse the trend toward ever higher farm property tax burdens, as measured by the effective tax rate. Policies that change the way schools are financed (or "tax swaps," as these proposals have been labeled) or targeted property tax reforms, such as circuit breaker programs, are two options that would help stabilize the increasing farm property tax burden in Illinois.

Table 1. Effective Property Tax Rates on Illinois Farms, 1975 to 1986

Tax Year	Effective tax rate, percent[a]			Property taxes as percent of land rent[b]
	Northern Illinois	Southern Illinois	Illinois	
1975.....	1.12	0.99	1.11	13.49
1976.....	1.02	0.88	0.96	11.74
1977.....	0.93	0.75	0.86	15.00
1978.....	0.74	0.62	0.72	15.29
1979.....	0.72	0.59	0.68	14.18
1980.....	0.69	0.54	0.65	15.11
1981.....	0.60	0.49	0.56	17.41
1982.....	0.58	0.51	0.56	18.66
1983.....	0.66	0.56	0.64	17.06
1984.....	0.85	0.72	0.82	19.04
1985.....	0.99	0.84	0.95	15.81
1986[c]....	1.11	0.94	1.07	18.23

[a]Effective tax rate is property taxes as percent of farmland, computed using only grain farms.

[b]This percentage refers to a group of northern and central Illinois grain farms. Land rent is the landlord's crop-share rent and includes property taxes.

[c]Land rent for 1986 is estimated.

Declining per acre average property taxes and increasing effective property tax rates present Illinois agriculture with a property tax paradox: a higher tax burden and lower per acre taxes. This paradox is illustrated in Figure 2. The solid line represents an index of per acre farm property taxes and the dotted line represents an index of effective farm property tax rates. From 1975 through 1981, the farm property tax burden in Illinois was declining as evidenced by the dotted line. During this same period, per acre farm property taxes were increasing. However, property taxes increased at a slower rate than the market value of Illinois farmland, resulting in a drop in the effective property tax rate.

The farm property tax paradox became apparent in 1983. The poor performance of the farm economy and the limited ability of rural governments to increase tax rates without referendum reversed the long-standing trend of ever higher per acre taxes. The poorly performing farm economy also drove the bottom out of the farmland market and reversed the long-standing trend of declining effective property tax rates for farmland. The significant increase in effective farm property tax rates is illustrated by the steep increase in the dotted line since 1983 (Figure 2). Herein lies the farm property tax paradox: lower per acre farm property taxes and a higher property tax burden on agriculture.

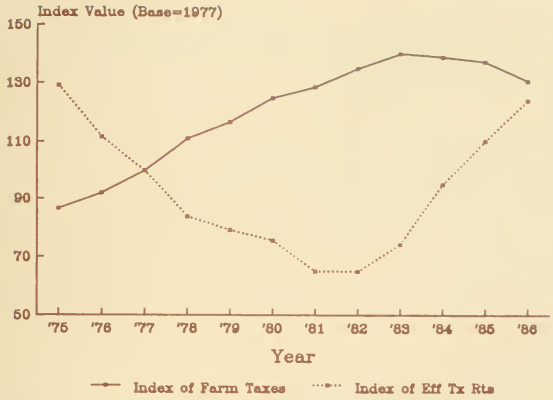

Figure 2. Index of per acre farm property taxes and effective farm property tax rates, 1975 to 1986--the farm property tax paradox.

Resolution of the farm property tax paradox could come from the farm economy, local taxing bodies, state policymakers, or some combination thereof. Significant increases in the price of Illinois farmland would lower the effective property tax rate. However, this does not seem likely to happen in the near future. Local taxing bodies, rural schools in particular, could dramatically cut spending, but this would be inefficient and would cause substantial hardship. Increased investment in education is probably necessary to remain economically competitive. This leaves resolution of the paradox to state policymakers. However, the political economy of spending and taxation in Illinois suggests that state policymakers will only address the paradox if more revenues from state tax increases are available. Of course, one option is to ignore the paradox and the imbalance that it may be causing.

SCHOOLS AND FARM PROPERTY TAXES

A major determinant of farm property taxes is the spending of rural schools and the availability of state school aid. About 75 cents out of every farm property tax dollar goes to rural schools; and of that 75 cents, about 60 cents is for teacher salaries. There is an obvious link between teacher contracts and farm property tax levels.

State taxpayers and local property taxpayers combine to spend more than $7 billion each year on primary and secondary schools in Illinois In 1985, the Illinois General Assembly enacted a broad set of educational improvement initiatives and since 1984, state appropriations for public schools have increased at unprecedented magnitudes. During this period, more than $800 million in additional state support was provided to schools. Illinois property taxpayers contributed an additional $600 million new dollars. This increase of over $1.4 billion far exceeded the rate of inflation and the growth in tax revenues from increased economic activity across

the state. It also represented a significant increase in commitment to public education. However, it is becoming more apparent that new state revenues are required if this trend of increased *real* school spending, at or above the 3 to 5 percent per year range, is to continue.

Spending $7 billion on schools represents an outlay of $4,120 per student. Increased interstate competition for economic activity has encouraged most states to increase school spending. Table 2 presents several items on school finance for Illinois and neighboring Great Lakes states. Comparing per pupil spending, Illinois ($4,120) ranked second behind Wisconsin ($4,512) in 1986-87. The U.S. average was $4,043. The second column represents school revenue growth between 1983 and 1987. During this period, Illinois ranked seventh with revenue growth of 11.1 percent. Other information in the table includes the percentage of state support, 1986-87 average teacher salaries, and average teacher raises in 1986.

Table 2. Per Pupil School Revenues, Teacher Salaries and Salary Increases, and Percent State School Support: Illinois Versus Great Lakes States

Great Lakes States	Revenues Per Pupil, 1986-87	Revenue Growth 1983 to 1987 (percent)	State Support 1985-86 (percent)	Teacher Salaries	
				Average 1986-87	Average Raise in 1986 (percent)
ILLINOIS	$4,120	11.1	39.2	$28,430	4.6
Indiana	3,752	29.0	58.2	25,684	5.6
Iowa	3,671	-0.3	40.7	22,603	4.2
Kentucky	3,029	15.9	68.6	22,612	8.0
Michigan	3,918	0.3	36.6	31,500	4.4
Minnesota	4,358	13.9	54.4	29,140	8.0
Missouri	3,454	18.1	38.9	23,468	7.2
Ohio	3,719	14.4	46.3	26,317	7.4
Wisconsin	4,512	19.4	39.8	28,206	5.3
U.S. Average	4,043	17.2	50.1	26,704	5.7

Source: Compiled by author from several sources.

It can be inferred from Table 2 that while Illinois is currently competitive with neighboring Great Lakes states on several aspects of support for education, if past trends continue, Illinois will drop below its current ranking and become less competitive. Maintaining the current ranking and competitive position will require revenue enhancements and more state money for Illinois schools. These competitive pressures will complicate any effort to address the farm property tax paradox.

SUMMARY

Although average per acre farm property taxes in Illinois declined for the third straight year, the effective property tax rate for farmland continued to climb. This property tax paradox will continue to challenge state policymakers as the interaction of declining rural property tax bases, increased rural school financial stress, and the need to remain competitive in primary and secondary education spending complicate matters. In the months ahead, tax policy initiative and leadership will be required to deal with these important state and local government

finance policy matters. One thing is certain: the farm property tax capacity now being lost will most likely not be recaptured. Economic renascence in rural Illinois will provide but limited relief to the farm property tax paradox and only a partial solution to rural school finance problems and will not be the salvation for state policymakers as they deal with these important issues.

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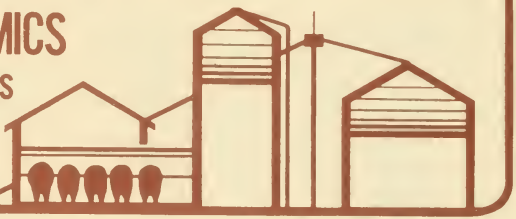

September 1987

87-11/Two Aspects of Land Rent: CRP Regulations and the Overage Lease

This newsletter deals with two aspects of land rent. It will introduce regulations related to the Conservation Reserve Program Regulations of the 1985 Farm Security Act. Then it will describe the overage lease agreement, a cash rent lease designed to allocate risk to both tenant and landowner.

CONSERVATION RESERVE PROGRAM (CRP) REGULATIONS

Questions and controversies have developed between landowners, tenants, and third parties about property rights in the CRP program.

If CRP regulations are read with care, it is clear that tenants' rights are extended substantially beyond the normal property rights now held by most tenants in the land they farm.

Most crop share leases are annual leases or have renewal clauses. My interpretation is that signing into the CRP program with an existing crop share lease tenant extends that lease for ten years. If the farm was subsequently devised by gift, inheritance, or sold, the lease would still be in force.

During this period, the landowner could probably terminate the lease only through litigation for cause--that is, abandonment or poor husbandry practices by the tenant. Poor husbandry is difficult to prove. The tenant is likely able to terminate only if he or she goes out of business or moves away.

The tenant and landlord should both sign and file form CRP-1, which indicates the share received by both parties under the agreement. If no form is filed or if there is disagreement as to the share, CRP proceeds shall be divided in the same way as the crops are divided under the existing lease.

The CRP regulations under cash rent are less specific. Most cash rent leases are for a definite period generally from one to three years. A new lease must be negotiated at the end of a lease period and tenants may change. (My interpretation is that if a farm being cash rented or a part thereof is bid into the CRP, proceeds would go to the tenant, at least under most existing cash rent leases.) Two CRP regulations affecting the cash lease are that the land must

have no fewer tenants than it had before and that the producer's unit shall be no smaller than it was before the farm was bid into the CRP. Therefore, when a cash lease terminates, the landowner must continue to rent the land--he or she cannot start farming the land or any smaller part of it that might be in the CRP.

These regulations clearly reduce the landowner's property rights and increase the tenant's rights. However, it may still be to the landowner's advantage to bid land into the CRP. Each landowner will need to assess their land and lease situation and act accordingly.

It is my opinion that the regulations are likely to receive more lenient interpretation by local ASCS offices and boards. With a crop share lease, it seems reasonable to divide the income in the first year as the share lease indicates: in the first year of the CRP the tenant must expend more machine time and labor to establish the conserving crop. Following establishment, less time and labor will be needed to maintain the crop. So the tenant might then accept an amount that would cover a custom rate on mowing or whatever was needed for maintenance, rather than the crop lease share of the payment.

THE OVERAGE LEASE OR CASH RENT BONUS LEASE

In recent years the "traditional" lease has varied. Cash leases became popular during the decade beginning in 1975. During the early part of this period, many farmers, because of high net farm income, bid to obtain more land to farm. They found they were more successful in offering higher cash rent than working within the traditional crop share lease.

Currently, lower farm income and farmers' reluctance to assume all the yield and price risk that is inherent in farming have convinced many tenants to go back to sharing the risk with the landowner in a crop share lease. Most landowners who have enjoyed the convenience and certainty of fixed annual cash rent do not want to return to the crop share lease.

There are compromise alternatives for sharing risk within the cash rent lease. A variable cash rent could be designed, with adjustment of a base or beginning cash rent using alternatives such as an index of land values, prices received by farmers, average county yields and average prices of corn and soybeans at a local elevator. A state land value index is published annually (usually in May) and an index of prices received by farmers is published monthly by the USDA. Average county yields are published by the Illinois Agricultural Statistical Service. Average prices can be picked up where the grain is marketed. The following equation can be used to calculate the cash rent on such a lease:

$$\text{Cash Rent for Current Year} = \text{Base Cash Rent} \times \frac{\text{Current Average County Yield}}{\text{Average County Yield for Last 5 Yrs.}} \times \frac{\text{Current Grain Price}}{\text{Average Grain Price for Last 5 Yrs.}}$$

The base rent should be the best cash rent that can be negotiated as a market or arm's-length rent between the landowner and tenant. Then that rent is adjusted up or down based upon yields and commodity prices in the market.

A few farmers are using the "overage" lease, also called the "cash rent bonus lease." This lease guarantees the landowner a fixed cash rent while protecting the farmer from some of the yield and price risk. The cash rent is set lower than the market cash rent,

such as 10 to 20 percent, depending on the variance of yields in the area. The landowner receives a bonus rent above the fixed cash rent when prices or yields (such as the gross value of production per acre) go above a stipulated level.

This rent bonus could be a percentage of the crop value when yields are above the average yield for the farm. For example, if the usual corn yield was 140 bushels per acre and the market cash rent was $100 per acre, the base fixed rent might be $90 per acre. When yield is less than or equal to 140 bushels, the landowner receives $90 per acre. When yield is above 140 bushels per acre, the landowner receives a share of the yield above 140 bushels per acre. That share normally ranges from 25 to 40 percent (less than half, because the farmer pays for the extra fertilizer to produce the higher yield).

The base rent, yield levels, and percentage of the overage must be negotiated by the parties involved. If a serious yield shortfall occurs only once in 10 years on the average, then a 10 percent reduction in market cash rent to get the base rent for the overage lease seems reasonable. If the chances are 1 in 5, then a 20 percent reduction seems appropriate. If records of yields on the farm are not available, the ASCS-designated yield for the farm can be used as the bonus rent threshold. Usually, the higher the threshold yield, the higher the percentage of the yield that should be paid as the bonus rent to the landowner. Another approach is to stipulate a value per bushel as the rent bonus--such as $.75 to $1 per bushel on corn and $1.25 to $1.75 per bushel on soybeans produced above the threshold.

To agree on some points in a lease takes time, so it is good to begin discussing changes in lease terms now. Ample time is needed to work out an agreement satisfactory to both parties. It is easiest to work out changes in a lease when there is regular communication throughout the year among all the parties involved. Both parties need to discuss problems as they happen rather than allowing disagreements to build over time to a confrontation. Even when there is regular communication by phone or over a cup of coffee, it is still good to sit down at least once a year around the kitchen table to formally discuss the lease arrangements. I strongly recommend an updated written lease. A written lease is a good memory crutch for the landowner and tenant. The lease may be important for relatives or an executor if something should happen to one of the parties directly involved, or if a serious disagreement developed over terms in the lease.

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URBANA, ILLINOIS 61801

September 1987

87-12/1988 Farmland Assessments: Down Ten Percent

Certified farmland assessed values for 1988, issued by the Illinois Department of Revenue to county assessing officers, reflect the impact of continued downward pressure from the poorly performing farm economy and assessment law amendments adopted in 1986. The 1988 certified values will be used by assessors to determine the taxable value of farms in 1988, the basis for tax bills paid by landowners in 1989 and revenues supporting rural schools and other local governments in fiscal year 1990. The farmland property tax cycle is continuous and is more than two years long. The property taxes paid by farmland owners this summer were based on 1986 assessments. The certified values used by assessors to set the 1986 assessments were issued by the State in May, 1985, and were determined using crop price and production cost data from 1980 to 1984. Thus, tax bills paid in 1987 are linked to the economic conditions in Illinois agriculture centered around 1982.

Lags in property tax assessments and associated tax bills are not unique to farm property but are characteristic of the property tax. Unlike other forms of taxation, such as the income tax and the sales tax, there is no market transaction to determine the tax base. Property assessments established by local officials, following procedures and approaches set forth in property tax law and State administrative guidelines, determine the base for the property tax. Information used in establishing assessments is always dated, which causes assessments and tax bills to be related to past, not current, economic conditions.

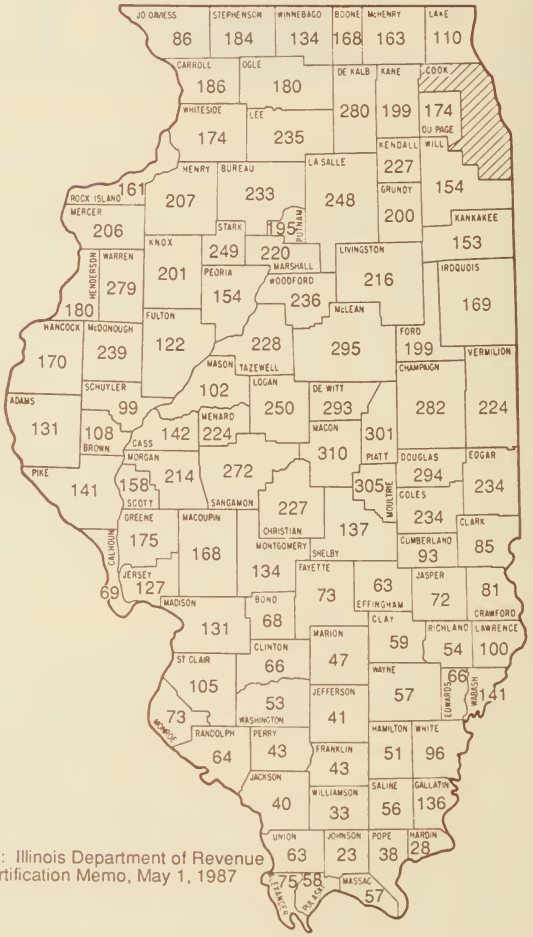
1988 FARMLAND CERTIFIED VALUES AND COUNTY COMMITTEES

Local officials are provided a certified value (dollars per acre) for each soil productivity index for soils that are cropped. Using these values and the soils identified in a farm, assessors determine the assessed value for the farm Assessors consider slope and erosion factors and flood hazards in assessing individual parcels of farmland. Unlike other real estate, which has to be reassessed only once every four years, farmland is reassessed every year using the appropriate certified values.

An important part of the local assessing process is the operations of County Farmland Assessment Review committees. Comprised of three farmers, someone from the Property Tax Board of Review, and chaired by the Supervisor of Assessments, the committee is responsible for working with assessing officials in the farmland assessment process. This committee can play an important part in the assessment of farmland, but actual involvement varies from county to county. Counties having "problems" with their farmland assessments frequently have inactive committees

1988 Certified Average Farmland Assessed Values

(dollars per acre)



Source: Illinois Department of Revenue
Certification Memo, May 1, 1987

In addition to the certified values, the State issues the expected average per-acre assessment for all farmland in each county. The variation in averages, from north to south, in Illinois reflects differences in soil productivity and farmland use Better soils that grow corn and soybeans, as expected, are assessed higher than poorer soils that are on a steep terrain and covered with trees. These are the major factors underlying the differences in expected average farmland assessments across counties.

For many counties, the expected 1988 average assessments are significantly less than in the past. Reductions of 30 and 40 percent between 1984 and 1988 in average assessments will be very common across the State. Without significantly higher tax rates, per-acre tax payments in 1989 (and revenues for schools and other local governments in fiscal year 1990) will follow assessments down.

FARMLAND ASSESSMENTS AND ASSESSMENT LEGISLATION

For the third consecutive year, the average per-acre property tax on Illinois farmland declined in 1986. The economic conditions in farming have placed downward pressures on farm assessments since 1981, but average per-acre taxes did not begin to slide until 1983. Between 1981 and 1985 the taxable value of farm real estate in the State dropped 21 percent. The most current year with complete data is 1985, and 1985 taxes were based on 1984 assessments. Expected continued reductions in rural tax bases prompted legislative action in 1983 and again in 1986 as policy makers sought to ease the adjustment of the rural tax base to the new economics of Illinois agriculture. This easing protects rural local government and school property tax revenues and insulates the State treasury from higher state school aid payments to rural districts. The 1986 legislation essentially stretches out the time that taxable values on farmland will take to adjust to the farm economy

This was accomplished in the 1986 assessment amendments by

- not using 1987 certified values to set assessments for 1987, but using 1986 certified values in both 1986 and 1987 (1987 certified values were less than 1986 certified values);

- limiting the annual change in certified values to 10 percent, beginning with the 1988 certified values (1988 certified values are 10 percent less than 1986 certified values because calculated 1988 values using commodity prices and production costs resulted in more than a 10 percent decline).

The 10-percent limitation will be the determining factor in farmland assessments for several years as assessments decline gradually and accommodate the economic conditions in the farm sector. Because of the lags in the assessment cycle and the limitation legislation, it is possible to have a reasonably accurate picture of future certified values. An illustration of past and expected future changes in certified values is given in Figure 1. The illustration is for a soil type with a productivity index of 120, and the base is 100 in 1981.

The index shows the slight downward pressures in 1982 and 1983 and the significant drop in 1984, which triggered the 1983 assessment law amendments. The calculations yielded some strengthening in certified values in 1985 and 1986 as the price responses from the PIK program and the 1983 drought were picked up. Beginning in 1987, the index reflects the 1986 assessment law amendment and not the farm economy. Using 1986 certified values in 1987 is evidenced by an index of 80 in both years. The 10-percent limitation determined the index of 72 for 1988 and the expected indexes through 1990.

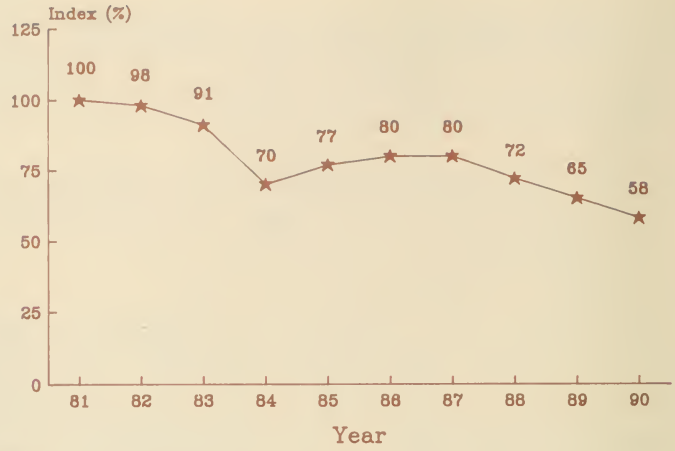


Figure 1. Index of certified assessed value for soils with productivity index of 120, 1981-1988 with projections to 1990.

An important point to draw from the illustration is the downward spiral in farmland assessments as the tax base adjusts to the farm economy. By the end of the decade, the assessed value for a soil type with an index of 120 will have declined 42 percent (index of 58). The 1986 changes in the farmland assessment law are easing the poor economic conditions on Illinois farms into the farm property tax base. Any reductions in property taxes associated with this phase-in will be welcomed by farmland owners but will place fiscal pressures on rural schools, townships, road districts and county governments.

SUMMARY

The 1988 certified values issued to assessing officers for use in setting 1988 assessments on farms reflect the 10-percent change limitation enacted into law in 1986. This legislation will phase the economic down-turn in the farm sector into rural property tax bases. Variation in soil quality and farmland use underlies the variation in 1988 average farmland assessments expected across Illinois counties. Lower farmland assessments through the rest of the decade will challenge State policy makers and raise important questions on the adequacy and method for financing important local government services and rural schools. Everybody favors property tax reform, but reform means something different to almost everyone. An important policy goal--and one that requires statemanship and effective political leadership--is to achieve a state and local public finance system that is judged fair, is balanced, and is adequate.

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November 1987

87-13/Farm Programs for 1988

THE 1988 FEED GRAIN PROGRAM

On September 29, 1987, the USDA made the first official announcement about the 1988 Feed Grain Program. Revisions are permitted by law until November 15 if there has been a significant change in total supply since the first announcement.

The Food Security Act of 1985 established target prices for corn and for other feed grains at a fair and reasonable relationship to corn. The target price for 1988 corn will be $2.97 per bushel, 2 percent below 1987. A reduction of 3 percent in 1989 and 5 percent in 1990 were also set by the 1985 Act. These target prices are shown in Table 1.

Table 1. Feed Grain Target Prices, 1985-90

	1985	1986	1987	1988	1989	1990
			(price per bushel)			
Corn	$3.03	$3.03	$3.03	$2.97	$2.88	$2.75
Oats	1.60	1.60	1.60	1.57[1]	1.52	1.44
Grain Sorghum	2.82	2.88	2.88	2.82	2.73	2.60
Barley	2.60	2.60	2.60	2.55	2.47	2.35

[1]Estimated for 1988, 1989 and 1990.

The loan rate for corn was set at $2.40 in 1986. After that, the loan rate was to be 75 to 85 percent of the average market price for the past five years, dropping the high and low years. However, the basic rate could not be decreased more than 5 percent per year. The Secretary is authorized to further reduce the loan rate from the basic rate by up to 20 percent if the average market price was 110 percent or less of the announced loan rate during the previous year or if the reduction is necessary to maintain domestic and export markets.

Consequently, the Secretary has used this authority for 1986, 1987, and 1988 to reduce the actual loan rates as shown in Table 2. The actual rate announced for 1988 corn will be $1.74.

Acreage reduction. In order to be eligible for loans and other program payments, producers who participate in the program will be required to reduce their base acreage by 20 percent. The entire amount required will be unpaid. However, USDA officials believe a paid diversion may eventually be offered. A paid diversion may be announced at any time.

Table 2. Feed Grain Loan Rates, Basic and Actual, 1985-1988

	1985	1986	1987	1988
Corn				
Basic	$2.55	2.40	2.28	2.17
Actual	2.55	1.92	1.82	1.74[1]
Grain Sorghum				
Actual	2.42	1.82	1.74	1.65
Oats				
Actual	1.31	.99	.94	.89
Barley				
Actual	2.08	1.56	1.49	1.42

[1]Maximum reduction possible.

Marketing loan. A marketing loan will not be allowed for the 1988 program.

Advance deficiency payments. No advance deficiency payments were announced for 1988. They were not included in the fiscal 1988 budget. However, legislation mandating the early payments was pending in Congress in early October.

Cross compliance. All feed grains except oats will be subject to limited cross compliance.

Sign-up dates. Sign-up details will be announced later.

THE 1988 WHEAT PROGRAM

The Secretary of Agriculture announced on July 2 that an acreage reduction of 27.5 percent would be required for the 1988 wheat crop.

The loan rate will be $2.17 per bushel, a 20-percent reduction from the basic loan rate of $2.71. The Secretary said the downward adjustment was determined necessary to maintain U.S. wheat competitiveness in domestic and international markets. This is the minimum allowed by law and is 5 percent below the 1987 loan rate.

The target price is $4.29 per bushel, the minimum set by law, 2 percent below the 1987 target price.

Paid land diversion. A paid land diversion program will not be implemented.

Marketing loan. No marketing loan or relative program provisions will be implemented.

Conservation acres. Producers will be required to maintain in acreage conservation reserve an area equal to 37.93 percent of the program payment acreage.

Farmer-owned reserve. The upper limit on the farmer-owned reserve quantity will be no more than 17 percent of estimated domestic and export use for the 1988-89 marketing year. If reserve quantities exceed the upper limit when 1988 crop wheat loans mature, entry into the reserve will not be permitted.

The signup period for the 1988 wheat program was postponed from the announced date of October 19, 1987. Signup will end on April 1, 1988.

In announcing the program, Secretary Lyng reserved the right to initiate later cost reduction options as outlined in Section 1009 of the Food Security Act of 1985. These options may include reopening or changing a program contract entered into by producers if they voluntarily agree to the change.

Table 3. Wheat Target Prices and Loan Rates, Actual and Projected, 1985-90

	1985	1986	1987	1988	1989	1990
Target price. . .	4.38	4.38	4.38	4.29	4.16	4.00
4.00						
Loan rate:						
Basic.	3.30	3.00	2.85	2.71	2.57[1]	2.44
Actual	3.30	2.40	2.28	2.17		

[1]Projected based on a maximum reduction of 5 percent for 1989 and 1990.

The 1985 Food Security Act set the 1986 basic loan rate for wheat at $3 per bushel. For 1988-90, the basic rates will be 75 to 85 percent of the simple average of the season price received by producers using the five preceding marketing years, and dropping the years with the high and low prices. This rate may not be lowered by more than 5 percent from the basic rate in the previous year.

Loan rates may be further reduced from the basic rate by up to 20 percent if the average market price was 110 percent or less of the announced loan rate during the previous year or if the reduction is necessary to maintain domestic and export markets.

The USDA must announce an acreage reduction or set-aside program by June 1 for wheat. Adjustments in the program can be made until July 31.

COMMON PROVISIONS OF 1988 FARM PROGRAMS

The following provisions will apply to feed grains, wheat, cotton and rice programs in 1988.

Acreage planted for harvest on a farm may not exceed the crop acreage bases for wheat, feed grains, upland cotton, and rice if a producer is to be eligible for price support loans, purchases, deficiency payments, or other program benefits

Offsetting compliance will not apply. This means that eligibility for a program payment or eligibility for a program commodity loan on one farm will not be affected by actions taken with respect to that commodity on another farm.

50-92 Option. If a producer chooses to use the 50-92 option provision, production of nonprogram crops will not be permitted. To be eligible to receive payments on 92 percent of the permitted acreage, producers must plant at least 50 percent of the permitted acreage to the program crop and devote the remaining permitted acreage to a conserving use.

Production of alternate crops on the designated Acreage Conservation Reserve (ACR) will not be permitted. Grazing of ACR land will be permitted at the request of th state ASCS committee, except during any 5-consecutive-month period designated by these committees. Haying of ACR land will not be permitted except under emergency conditions.

Adjusting crop acreage bases. Farmers will not be permitted to adjust any crop acreage base with a corresponding downward adjustment in other crop acreage bases on the farm. However, adjustments in bases will be considered when producers must change cropping practices in order to carry out conservation compliance requirements on highly erodible land.

Generic commodity certificates will continue to be a part of the 1988 farm programs, if needed. The extent of their use will be determined as program payments are made.

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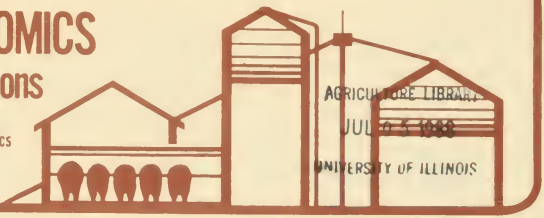

November 1987

87-14/Economics of Fertilizer Use

The economic choices regarding fertilizer involve evaluating the trade-offs among crop choices, the amount of fertilizer to apply, why to apply it, and alternative uses of limited funds for production expenses. To make economic choices, it is important to recognize the relevant costs.

The economic rules for determining the quantity of nitrogen fertilizer to apply are very simple. The first rule is that the value of added product (the value of extra yield due to extra fertilizer) must be equal to or greater than the cost of the added fertilizer (marginal revenue greater than marginal cost). The second rule is that because capital may be limited, the marginal return of the last dollar spent on fertilizer must be equal to or greater than its return in other uses (equal marginal return or opportunity cost).

EVALUATING OPTIMUM NITROGEN FERTILIZATION RATES

The basic information needed to determine the most profitable nitrogen fertilization rate is the physical production function, or the relation of crop yields to varying rates of fertilizer application. By using output and input prices, the most profitable application rate can be determined. The data in Table 1 shows the net returns from various rates of nitrogen fertilization on continuous corn when the price of corn is $1.80 per bushel, the cost of nitrogen is $0.12 per pound, and the other direct costs related to yield are $0.45 per bushel harvested.

Applying nitrogen at a rate of 190 pounds per acre produces the maximum return of $186.37 per acre. Applying 10 pounds less decreases net returns by $0.29 The last 10 pounds applied gives an added return of $1.98 at an added cost of $1.70 The net return over variable cost per dollar of nitrogen spent is $0.24. If the $1.70 spent on the last 10 pounds of nitrogen could return more than $1.98 in some other use, then total farm returns could be maximized by stopping at the 180-pound application level.

The optimum level of nitrogen use depends upon the technical relation of crop yield and units of nitrogen applied, the price of the product, the cost of nitrogen, and other direct costs related to yield. The data in Table 2 are derived from the response curve used in Table 1. As the price of corn increases, the rate of nitrogen application should increase. On the other hand, when the cost of the nitrogen fertilizer increases, fewer pounds of nitrogen should be applied. The amount of the reduction depends upon the response function and the magnitude of the changes in prices. For example, in Table 2, reducing of the corn price from $3.00 to $1 50

Table 1. Returns from Nitrogen (N) Fertilization on Corn

N applied (lb/A)	Yield (bu/A)	Marginal increase (bu/A)	Value of marginal increase @ $1.80	Cost of added N plus other direct costs[a]	Total returns over N and other direct costs	Average net return per $N	Marginal net return per $N
100	135.1	...	...	...	...	...	...
110	138.4	3.31	5.96	2.69	173.62	13.15	2.73
120	141.4	3.04	5.47	2.57	176.52	12.26	2.42
130	144.2	2.76	4.97	2.44	179.05	11.48	2.11
140	146.7	2.48	4.47	2.32	181.24	10.79	1.79
150	148.9	2.21	3.97	2.19	182.98	10.17	1.48
160	150.8	1.93	3.48	2.07	184.39	9.60	1.17
170	152.5	1.65	2.98	1.94	185.42	9.09	0.86
180	153.8	1.38	2.48	1.82	186.08	8.61	0.55
190	154.9	1.10	1.98	1.70	186.37	8.17	0.24
200	155.8	0.83	1.49	1.57	186.28	7.76	-0.07
210	156.3	0.55	0.99	1.45	185.83	7.37	-0.38
220	156.6	0.27	0.49	1.32	184.99	7.01	-0.69
230	156.6	0.00	-0.01	1.20	183.79	6.66	-1.00
240	156.3	-0.28	-0.50	1.07	182.21	6.33	-1.32

[a]N at $0.12 per pound and other direct costs at $0.45 per bushel.

Table 2. Optimum Rate of Nitrogen (N) on Corn

Corn price ($/bu)	Price of nitrogen 8¢/lb	12¢/lb	16¢/lb
	-------*pounds of N per acre*------		
$1.50	197	184	180
2.25	209	201	193
3.00	214	208	202

and doubling the nitrogen price from $0.08 cents to $0.16 cents results in a 34-pound or 16-percent reduction in the optimum application rate.

The optimum rates calculated in Table 2 are averages over four years. Depending upon moisture conditions and other environmental factors, the optimum rate may vary from year to year. There is a penalty of lost return when an application less than the optimum amount is applied. The penalty for applying more than the optimum amount is the cost of the extra fertilizer plus any loss of yield if production begins to diminish. While the net profits are less in both cases, which has the potential for greater losses?

Overshooting the optimal fertilizer rate violates the first rule of economic choice--the relation of marginal cost and marginal return. Producers who have limited financial resources should also be applying the second rule--equal marginal returns. That is, they should compare the marginal return of the last dollar invested in fertilizer with that dollar's potential return if spent on seed, pesticides, machinery, or other uses.

Because of weather variation and other factors, the average optimum level of nitrogen, identified in Table 2, may not be optimum each year. If nitrogen is applied at the average optimum level of 195 pounds in each of four years, undershooting and overshooting can be demonstrated by examining applications of 180 and 210 pounds per acre. Results for this particular nitrogen-yield response curve indicate that applying 15 pounds per acre less than the average optimum level of nitrogen yields higher returns than applying 15 pounds per acre over the average optimum level. For example, at a market price of $1.80 per bushel and a nitrogen application of 180 pounds per acre, average returns per acre (on the average over the four years) are $1.95 less than the maximum returns per acre for the four years, whereas an application of 210 pounds of nitrogen per acre returns $2.23 per acre less than the maximum.

Target yields are useful to producers only if an appropriate target is used for the particular region of the state and soil type. The average potential yield for a given region can be estimated as the average maximum yield over a four- to ten-year period. Four- to five-year estimates for Dekalb, Carthage, and Toledo, Illinois, in the late 1960s are given in Table 3.

The amount of nitrogen (as a ratio) that should be applied to maximize yield is 1.22, 1.27, and 1.36 times the potential yield at Dekalb, Carthage, and Toledo, respectively. The last two lines of Table 3 show the ratio of nitrogen fertilizer to the potential yield for maximizing net returns for corn prices of $3.00 and $1.80. For the Dekalb example, the nitrogen application rate which maximizes net returns given an expected corn price of $1.80 per bushel is 149.7 pounds (1.09 X 137.3).

Table 3. Average Ratios of the Optimum Nitrogen Application Rate to Potential or Maximum Yield[a]

	Site		
	Dekalb	Carthage	Toledo
Average Potential Yield[b]	137.3	147.7	120.8
Maximum Yield Ratio[c]	1.22	1.27	1.36
Optimum Yield Ratio[c]			
@ $3.00/bu	1.15	1.22	1.27
@ $1.80/bu	1.09	1.17	1.18

[a]N @ $0.12 per pound and other direct costs at $0.45 per bushel.
[b]The average maximum yield for an estimated response curve.
[c]The ratio of nitrogen fertilizer to the average maximum yield.

Perhaps as important as determining the rate of nitrogen application is the effective use of nitrogen for producers short of capital. Later applications of fertilizer, allowing for fewer losses from denitrification, may be an effective way to reduce costs rather than reducing amounts applied.

EVALUATING PHOSPHORUS AND POTASSIUM APPLICATION RATES

The evaluation of annual rates of application for phosphorus (P) and potassium (K) differs from that for nitrogen. Nitrogen application rates are based upon the nutrient needs of the crop to be grown each year. On the other hand, phosphorus and potassium normally remain in the soil unless removed by a growing crop or by erosion.

Traditionally, the recommendations from Illinois fertilizer specialists for phosphorus and potassium have been based on establishing the base soil test and adding enough fertilizer nutrients to build the soil up to a test level at which the yield of the most demanding crop would be maximized, plus enough to replace the amount the crops remove.

Generally, the low costs of P and K fertilizer have supported the economic rationale for investment in a four-year build-up program. In the analysis of soil fertility buildup, we find that response rate is very high at low test levels and diminishes at higher test levels. For example, the change in yield with changes in test level on low phosphorus-supplying soils is shown in Table 4. Corn yield increases 14 percent, from 25 to 35 P_1 test levels. However, from 45 to 55, the increase is only 1 percent.

The average yield increase is great enough to recover amortized investment cost in four years or less, at least up to 45 P_1 test level. Current prices for soybeans will cover the costs of increasing the P_1 test level to 35. However, if the farm is in a corn-soybean rotation, the test level should be maintained at 45, so as not to restrict the profitability of the corn enterprise. Even low prices for wheat will support an increase in phosphorus to the 65 P_1 test level.

Similarly, in Table 5, with $2.25 corn, the value of the expected yield increase exceeds the four-year amortization payment required to pay off the initial build-up investment until the 240 K_2O test level is reached. For soybeans and wheat, K test levels are justified up to 200 and 160, respectively. A payoff period of more than four years would be required to justify buildup to higher test levels of both phosphorus and potassium.

In recent years, many producers have faced financial limits on amounts of borrowed funds available for production expenses. Consequently, the economic conditions for build-up programs are less favorable. With limited working capital, many producers are examining alternative options in making fertilizer applications of P and K for their crops.

SUMMARY

Optimum fertilizer rates are determined by equating the value of the increased yield of the crop to the cost of the additional fertilizers. Moreover, when capital is limited the return for each additional dollar invested in fertilizer must be equal to or greater than its return in other investments. Therefore, a reduction in the ratio of commodity prices to fertilizer costs, with everything else held constant, leads to lower optimum levels of fertilizer.

For nitrogen fertilizer recommendations, target yields are useful only if it is possible to achieve the target level given soil conditions and other inputs. The

Table 4. Economics of Phosphorus (P) Buildup

	Change in P_1 test level			
	25 to 35	35 to 45	45 to 55	55 to 65
Build-up quantity of P_2O_5 required (lb/A)	90	90	90	90
Investment cost at $0.22/A	$ 19.8	$ 19.8	$ 19.8	$ 19.8
	percent of potential			
Base yield of crop,				
Corn	80	94	98	99
Soybean	86	97	99	99
Small grain	48	88	80	91
Expected yield after buildup,				
Corn	94	98	99	100
Soybean	97	98	100	100
Small grain	66	80	91	97
Marginal increase in yields,				
Corn	14	4	1	1
Soybean	11	2	1	0
Small grain	18	12	11	6
Years to reach build-up level of yield	4	4	4	4
Average yield increase, per acre	*bushels*			
Corn (150-bu potential)	12.0	6.0	1.5	1.5
Soybeans (60-bu potential)	6.6	1.2	0.6	0.0
Wheat (80-bu potential)	14.4	9.6	8.8	4.8
Annual 4-year amortized cost of build-up fertilizer investment at 10% interest, per acre	$6.25	$6.25	$6.25	$6.25
Breakeven increase in yield of crop,	*bushels*[b]			
Corn at $3.00 (2.55)[a]	2.45	2.45	2.45	2.45
2.25 (1.80)[a]	3.47	3.47	3.47	3.47
1.50 (1.05)[a]	5.95	5.95	5.92	5.95
Soybeans at $6.00 (5.55)[a]	1.13	1.13	1.13	1.13
5.00 (4.55)[a]	1.37	1.37	1.37	1.37
4.00 (3.55)[a]	1.76	1.76	1.76	1.76
Wheat at $4.00 (3.40)[a]	1.87	1.87	1.87	1.87
3.00 (2.40)[a]	2.60	2.60	2.60	2.60
2.00 (1.40)[a]	4.46	4.46	4.46	4.46

[a]Net price equals market price less yield-related variable cash costs of maintenance fertilizer, harvesting, drying, and marketing.

[b]The boxed area represents the test levels of phosphorus where the value of the increase yield exceeds the 4-year amortized cost.

Table 5. Economics of Potassium (K) Buildup

	Change in K test level				
	80-120	120-160	160-200	200-240	240-300
Build-up quantity of K_2O required (lb per acre).....	160	160	160	160	160
Investment cost at $0.125/lb.....	$ 20	$ 20	$ 20	$ 20	$ 20
	percent of potential				
Base yield of crop,					
Corn.....	71	81	88	93	97
Soybean.....	75	85	92	96	98
Small grain.....	87	95	98	99	100
Expected yield after buildup,					
Corn.....	81	88	93	97	99
Soybean.....	85	92	96	98	99
Small grain.....	95	98	99	99	99
Marginal increase in yield,					
Corn.....	10	7	5	4	2
Soybean.....	10	7	4	2	1
Small grain.....	8	3	1	0	0
Years to reach build-up level of yield.....	4	4	4	4	4
Average yield increase, per acre	*bushels*				
Corn (150-bu potential).....	15.0	10.5	7.5	6.0	3.0
Soybean (60-bu potential).....	6.9	4.2	2.4	1.2	0.6
Wheat (80-bu potential).....	6.4	2.4	1.8	0.0	0.0
Annual 4-year amortized cost of build-up fertilizer investment at 10% interest, per acre.....	$6.31	$6.31	$6.31	$6.31	$6.31
Breakeven increase in yield of crop,	*bushels*[b]				
Corn at $3.00 (2.55)[a]	2.47	2.47	2.47	2.47	2.47
2.25 (1.80)[a]	3.51	3.51	3.51	3.51	3.51
1.50 (1.05)[a]	6.00	6.00	6.00	6.00	6.00
Soybeans at $6.00 (5.55)[a]	1.14	1.14	1.14	1.14	1.14
5.00 (4.55)[a]	1.39	1.39	1.39	1.39	1.39
4.00 (3.55)[a]	1.78	1.78	1.78	1.78	1.78
Wheat at $4.00 (3.40)[a]	1.86	1.86	1.86	1.86	1.86
3.00 (2.40)a	2.63	2.63	2.63	2.63	2.63
2.00 (1.40)[a]	4.51	4.51	4.51	4.51	4.51

[a]Net price equals market price less yield-related variable cash costs of maintenance fertilizer, harvesting, drying, and marketing.
[b]The boxed area represents the test levels of phosphorus where the value of the increase yield exceeds the 4-year amortized cost.

potential yield for a particular farm can be estimated based on historical information from that farm. The economic optimal nitrogen application can be estimated based on the potential yield, along with fertilizer cost and commodity price information.

Similarly, the decision to make any phosphorus and potassium application depends on the difference in yield responses and upon the alternative return for scarce operating dollars that would be required for the fertilizing expense If the producer can be sure that yields with no additional P and K fertilizer would not decline, then that option is more profitable in the short run.

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FARM ECONOMICS
Facts and Opinions

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87-15/Land Prices on the Way Up?

HISTORY IS THE PROLOGUE FOR THE FUTURE

The low on land prices occurred about the middle of October 1986. This was when prices of some sales began to be a little higher than comparable sales only a month or two earlier. Land prices have continued to increase since then.

We have been supplementing the USDA annual survey with a quarterly survey. The annual USDA survey showed a decline from April 1, 1986 (index number 73), to April 1, 1987 (index number 67), of 8 percent for Illinois. We believe most of this reported year-to-year decline occurred in the summer of 1986. Our surveys show land prices were actually rising throughout 1987, particularly on the higher quality land. The average increase on the better quality, better located land since the low last October has been in the 5- to 10-percent range. Some instances of individual sales suggest larger increases. Usually when these higher sales are investigated, however, special circumstances explaining the higher values--such as the whole crop (without production expenses) included in the sale, a good set of buildings sold off (raising the overall per acre value) or investors forced to buy for tax purposes.

Land of mediocre and lower quality has not enjoyed much price resurgence. In fact, land of mediocre quality has only held its own or even declined slightly The price of lower quality land has generally been stabilized and supported by the government Conservation Reserve Program (CRP), in which the government is renting land that should be planted in a conserving crop for ten years The government is paying rents that are comparable or higher than cash rents a farmer might expect to pay on the same land. There are individual and groups of investors looking for land to buy that is already in the CRP or is eligible to enter the CRP

The year-to-year decline estimated by USDA (1986-1987) for Iowa was 11 percent. According to the most recent reports coming from Iowa, land prices on the better land have

turned around sharply by 10 percent or more in the last 90 days. This is not surprising because land prices in Iowa increased the most percentage-wise at the end of the boom and declined the most from spring 1981 to 1986. Prices probably overshot on the downside as well as on the upside. Iowa also has the same situation as Illinois with the mediocre or poor land.

Illinois has a more stable agricultural base because of the nearness to market and lower marketing costs, as well as a less variable climate. A good example is that the target price and loan rate for corn in Iowa is 10 to 12 cents per bushel less than in Illinois (except for Iowa counties along the Mississippi). Other mitigating factors favoring Illinois are the stronger urban influences on land value and a generally unrestricted land market. Iowa restricts foreign investment in farmland, as do several other states. Illinois has a law passed in the late 1800s restricting foreign investment, but I cannot find that it has been enforced in modern times.

Land prices have increased this year for a number of reasons. Probably the two most important are higher net incomes and lower rates of interest. Interest rates on three-month treasury bills reached a low of 5.05 percent on October 10, 1986, which corresponded to the time of the low in the land market. Certificates of Deposit (CDs) were under 5 percent. Five-year governments were at 6.72 percent and long term at 7.99 percent. Interest rates remained low through July of this year. Since July, interest rates have been rising partly to maintain foreign interest in government securities in the face of a falling dollar and partly in anticipation of inflation. Short-term rates have increased about 1½ percent and long-term rates have increased about 2 percent. This is a 25-percent increase in rates. Since the stock market crash rates have again receded. How long rates can remain low depend on the Federal Reserve and on willingness for other countries to accommodate us.

Farm income with substantial government subsidies, high livestock prices, and lower operating costs (due partly to lower input costs, less machinery investment, and fewer planted acres) has resulted in significantly higher net farm income. Most of the land sales made this year have been to cash or mostly cash buyers. The higher income and higher rate earned on land precipitated a shift from government securities and CDs to land by many people who were conservative investors through the land boom. This is true particularly among farmers who think land prices might be about as low as they will go. The psychology in agriculture has changed over the past year to a more optimistic viewpoint. This affects the market.

The Federal Land Bank Districts in the Midwest, with the help of some concessional interest rates, have been reducing their land inventory at prices higher than most people had expected. They have been able to sell much of the better quality land in their inventory. However, lenders including the Farmers Home Administration own about 11,000,000 acres.

WHAT DOES THE FUTURE HOLD ON LAND VALUES?

A number of positive factors are currently working in the market:

(1) no other major capital asset has dropped more in value since 1981 than farmland--except perhaps gold, silver, and oil; and these others are now going up in price; (2) net rent has declined less than land value, increasing the rate earned; (3) mortgage interest rates and rates on alternative investments are lower than in 1981, (4) net farm income has increased since 1986; (5) land prices in terms of gold are close to Depression lows when 3 ounces of gold would buy an acre of good land, and now it can be bought for 3.5 to 4 ounces per acre; (6) dollar devaluation against some currencies should improve exports; and (7) devaluation combined with the large and continuing trade deficit has put many times the dollars in foreign hands as in the 1970s land boom. Foreigners (particularly Japanese) have already strongly invaded the U.S. commercial real estate market. If they should start buying land, land prices would move higher. All Illinois farmland is now valued at about 29 billion dollars. This is equal to two to three months of our trade deficit.

The elements of downward risk include (1) land is generally illiquid, thereby increasing risk on the downside; (2) Western nations have agreed to eliminate agricultural subsidies by the year 2000; (3) current agricultural subsidies, along with the surplus stocks overhanging the market, are very significant; (4) higher interest rates along with a higher real rate (a larger difference between inflation and rates of interest) seems probable; (5) the value of the dollar against currencies of producing countries has not declined, causing them to continue as strong competitors in the world market; (6) the new breed of farmers are financially oriented businessmen as well as production specialists who are less likely to bid up farmland prices, forcing returns to land below competitive alternatives; and (7) lenders still own a large supply of land overhanging the market.

In summary, an optimistic psychology in the market (coupled with lower interest rates and higher farm incomes) has brought a turnaround in the market. The main negative forces are the politically vulnerable government subsidies and interest rates that are rising. In my opinion, the land market will continue at about its current level, on a plateau about 5 to 10 percent above the October 1986 bottom. The direction from here may not be clear for some time.

If government subsidies are reduced significantly or the real rate of interest increases significantly, the October 1986 bottom could prove to be a false bottom.

The stock and bond markets are now taking a beating. This should not affect land markets much unless it turns into a real bear that affects the whole economy. The current pessimistic climate in the financial markets could, of course, slop over into the real estate markets.

If inflation does increase significantly or foreigners re-enter the land market using their large dollar balances, all bets are off. Even then it is doubtful whether land values will rise as much as the inflation rate over the long run, because agriculture is a declining industry relative to the total economy.

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FARM ECONOMICS
Facts and Opinions

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87-16/Income Tax Planning for Farmers

Income tax planning is normally considered to be an exercise that a farmer goes through late in the tax year to carefully assess the likely tax impact on his or her business. Good tax management should be a year-round process because so many transactions can have substantial tax consequences. More than 2 or 3 weeks late in December may be required to make the necessary adjustments that will result in a good tax plan.

Good tax planning through the remainder of 1987 will be important in minimizing your income tax liability. Government program participation has reduced cash expense and accelerated income through advance deficiency and diverted acre payments. Depreciation is running out on many capital purchases that were made during the early 1980s. Grain inventories carried from 1986 to 1987 were above average because of high 1986 yields. Finally, livestock producers have enjoyed above average returns the past year. Along with all of these economic factors, the Tax Reform Act of 1986 lowered rates for both 1987 and 1988 but also extended depreciable lives on capital purchases and disallowed many deductions that were taken in prior years.

The basis for tax planning is an accurate and comprehensive set of farm business records. For most sole proprietors, this should include business transactions as well as personal expenditures that might qualify for itemized deductions. More farmers are moving toward a procedure of reconciling all funds flowing through the account in order to verify mathematically that no items have been omitted or duplicated.

In addition to summarizing year-to-date data for 1987, an awareness of the significant changes created by the Tax Reform Act of 1986 is essential. Our procedures here will focus primarily on the cash-basis farmer, but most of the consideration of alternatives will apply to the accrual-basis person as well.

The goal of tax planning is to minimize the amount of income tax that has to be paid over time. This is normally accomplished by leveling the taxable income to avoid the wide fluctuations that might cause you to be pushed into the higher tax brackets. Because of the magnitude of the self-employment tax rates, planning may occasionally take another route. The Tax Reform Act of 1986 has widened the interval from one rate to the next so that you may not have to be quite as precise in the planning in order to avoid higher tax rates.

The first step, as suggested above, is to post to-date all transactions in your farm record books, then run totals on all of the accounts. Record these totals on a tax worksheet or on a blank copy of last year's schedule F and/or form 4797. Many tax worksheets are designed with three columns:

Year-to-date,
Projections and/or adjustments, and
Total.

An example income tax projection worksheet from the North Central Regional Publication No. 2, *Income Tax Management for Farmers*, appears at the end of this article.

Next, list all income that you will be receiving before the end of the year and all expenses that must be paid by the end of the year. Then list income that may be received this year or carried over into next year and list expenses that can be paid by the end of the year but are not due until the following year. This will give you an idea of what your projected income will be for the year and to what extent you can make adjustments to that projection.

Last year's depreciation may serve as a guide from which to make an estimate for this year. With so many items having reached the end of their depreciable life under the Accelerated Cost Recovery System (ACRS), it would be best to review last year's schedule rather thoroughly. The depreciation on current year purchases should be included in an estimate. Some computer programs have the capability of calculating next year's depreciation for items currently on the schedule.

A review of the previous year's tax return is normally the starting point for an evaluation and relative comparison of the current year's income level. It is only a guide, however, because the current year and the forthcoming year can still be changed.

Several figures might help determine both the gross income and the net income levels you want to attain. Many grain farmers follow a procedure of carrying over a substantial portion of the crop into the next calendar year. Once this year's gross income-to-date has been calculated, compare it with a projection of what next year's sales may be, based on the current inventory. If there is price uncertainty associated with next year's sales, plan on letting next year's gross run at least 5 percent higher than this year's.

If parts of two crops are sold in one year, it is a little more difficult to identify what gross income you want to report. It probably should approximate an annual projected gross income for the farm.

For those individuals who have an accrual-basis income statement, the previous years's accrual net income may serve as a guideline for the current year's cash-basis income. Projecting from such a figure should help to bring you close to the net income that good tax planning would suggest you might want to achieve. In gathering data for a comparison with last year, make sure that any significant non-farm data is also included in your analysis.

The Tax Reform Act of 1986 requires that you familiarize yourself with many new facts and figures in doing tax planning. You may want to call on the assistance of your accountant, Farm Business Farm Management (FBFM) field staff, or other tax

The Federal Income Tax Projection Worksheet

Use this worksheet throughout the year in planning farm business and tax management strategies. If you do not use it throughout the year, use it in November to plan tax savings in December.

		Amount to Date	Estimated Rest of Year	Estimated Year's Total
FARM RECEIPTS:				
Sales of product raised[1] and miscellaneous receipts.				
Cattle, hogs, sheep and wool, etc.		$_____	_____	_____
Poultry, eggs and dairy products		$_____	_____	_____
All crop sales		$_____	_____	_____
Custom work, prorations and refunds agriculture program payments		$_____	_____	_____
Total sales and other farm income	(1)	$_____	_____	_____
Sales of purchased market livestock $_____		$_____	_____	_____
Purchase cost (subtract) $_____		$_____	_____	_____
Gross profits on sale of purchased livestock[2]	(2)	$_____	_____	_____
Gross farm profits[3] (Item 1 + 2)	(3)	$_____	_____	_____
FARM EXPENSES:				
Labor hired $_____	Veterinary, medicine $_____			
Repairs, maintenance $_____	Gasoline, fuel oil $_____			
Interest $_____	Storage, warehousing $_____			
Rent of farm, pasture $_____	Taxes $_____			
Feed purchased $_____	Insurance $_____			
Seed, plants purchased $_____	Utilities $_____			
Fertilizers, lime $_____	Freight, trucking $_____			
Machine hire $_____	Conservation, expenses $_____			
Supplies purchased $_____	Other $_____			
Breeding fees $_____	Other $_____			
Total cash farm expenses	(4)	$_____	_____	_____
Depreciation on machinery improvements, dairy and breeding stock	(5)	$_____	_____	_____
Total deductions (Item 4 + 5)	(6)	$_____	_____	_____
Self employment farm income (Item 3 less item 6)	(7)	$_____	_____	_____
OTHER INCOME:				
Net taxable gain from Schedule D (Sales of dairy and breeding stock machinery and other capital exchanges	(8)	$_____	_____	_____
Taxable non-farm income	(9)	$_____	_____	_____
Adjusted gross income (Item 7 + 8 + 9)	(10)	$_____	_____	_____
Less: standard deduction or itemized deductions[4]		$_____	_____	_____
$1,900 × _____ personal exemptions[5]		$_____	_____	_____
Total non-business deductions and exemptions	(11)	$_____	_____	_____
Taxable income (Item 10 less item 11)	(12)	$_____	_____	_____
Estimated income tax (calculated from applicable tax computation table or rates)	(13)	$_____	_____	_____
Estimated self-employment tax[6] (Item 7 × 12.3)	(14)	$_____	_____	_____
TOTAL TAX (Item 13 + 14)	(15)	$_____	_____	_____
Less Credits: allowable investment credit and carryover, gas tax, income tax withheld and estimated tax paid	(16)	$_____	_____	_____
Estimated tax due (Item 15 less item 16)	(17)	$_____	_____	_____

Last year's marginal tax bracket _____ %
This year's estimated marginal tax bracket _____ %
Next year's expected marginal tax bracket _____ %

[1] For accrual method include sales of all livestock

[2] Omit for accrual method

[3] For accrual method adjust for change in inventory and new livestock purchases

[4] Use itemized deductions if larger

[5] Exemption for 1987 see current tax regulations for subsequent years

[6] Rate for 1987 see current tax regulations for subsequent years

practitioners. Some of the more significant changes to keep in mind include the following:

1. Tax rates have been reduced and the brackets have been expanded. For example, the marginal income tax rate for a married couple filing a joint return is 15 percent on taxable income between $3,000 and $28,000.
2. Personal exemptions have been increased from $1,080 to $1,900.
3. The standard deduction for a married couple filing a joint return has increased by $90 to $3,760, but is scheduled to increase to $5,000 in 1988.
4. A self-employed individual is allowed to deduct 25 percent of what he or she pays under an insured or self-insured family health plan. This is not available if the self-employed person participates in a health plan furnished by his or her spouse's employer.
5. Capital purchases of up to $10,000 on eligible property may be deducted in the year of purchase.
6. Limits have been placed on the amount of prepaid farming expenses that can currently be deducted if you use the cash-basis method of accounting. The limitation applies to prepaid expenses in excess of 50 percent of the non-prepaid farming expenses.
7. Deductions for IRA contributions are phased out for middle- and high-income individuals who are covered under another qualified pension plan.

Items that have been eliminated by this legislation include the following:

1. Two-earner deduction for married couples.
2. Income averaging.
3. Capital gains exclusion--note there are special rules for participants in the dairy herd buy-out program.
4. Land clearing expense--remember also that conservation expenses must be part of an approved plan
5. Dividend exclusion.
6. Charitable contributions--now must be included with other itemized deductions.

While most producers are concerned about ways to lower income before the end of the year, there may be certain instances where net income needs to be increased before the end of the year. Low crop yields the previous year, a change in the farm lease from a crop share to cash rent, or farming increased acreage are some reasons farm income may be low for a given year. At the minimum, net farm and nonfarm income should be high enough to cover the taxpayer's standard deductions and personal exemptions. Some ways to increase income include selling some new crop grain and collecting before year end, and delaying payment of those expenses that are not required to be paid until after the first of the year.

Farmers looking for ways to lower their income before the end of the year may defer reporting income from fall grain sales by signing a delayed payment contract with their elevator when the grain is sold. These contracts state that proceeds from the grain sale cannot be collected until after the first of the year

Another way to lower current year's income is to prepay next year's farm-operating expenses. When doing this, be sure your purchase invoice states the quantity and price of the supplies. Just a down payment toward next year's bills is not acceptable. There also should be an economic reason for prepaying expenses, such as receiving a cash discount for paying ahead. Some of the more common expenses that are prepaid include fertilizer, seed, feed, and chemicals. Also, you may want to pay up any accrued interest or drying and storing charges. Prepayments of interest, cash rent, or insurance are not deductible. When prepaying expenses, be sure to pay those that yield the largest economic return first, that is, those that hav the largest cash discount and those that will need to be paid soon after the first of the year.

Producers who have purchased machinery or equipment during the year may elect to expense those purchases in the current year instead of setting them up on depreciation. Producers can expense up to $10,000 of eligible capital purchases. If few capital purchases have been made this year and no more are planned, the prepayment of cash-operating expenses should normally carry a higher priority for added deductions than machinery and equipment purchases.

Another method used to lower income is contributing to an IRA, Keogh plan, or both Contributions to these plans generally reduce gross income. The Tax Reform Act of 1986, however, has placed some limitations on the deductibility of IRA contributions. It should be noted that although contributions can be made to Keogh plans up to the due date of the tax return, the plan must be established by the end of the tax year to allow a deduction for those contributions.

Changes in tax laws and relatively better incomes have increased the importance of tax planning for farm operators. The key to tax planning is to start now to allow time for adjustments to be made before the end of the year.

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FARM ECONOMICS
Facts and Opinions

DEPARTMENT OF AGRICULTURAL ECONOMICS
URBANA, ILLINOIS 61801

December 1987

87-17/The Financial Future of Illinois Cash-Grain Farms[1]

Illinois cash-grain farms continue to face uncertainty about the future of agriculture. Commodity prices remain at low levels and farm program support prices are decreasing. Although land values appear to be stabilizing, a return to the levels of the early eighties seems unlikely in the near future. This report projects the financial performance of Illinois cash-grain farms under a set of current commodity prices and production costs. These projections are made under different tenure patterns and initial debt-level assumptions. Farmers and their advisers can use this information in evaluating the future financial performance of farm firms.

The recent economic stress in agriculture has forced many farm firms to reevaluate or restructure existing production, marketing, and financial plans and practices. Some of the ways in which farm firms are dealing with financial stress are by negotiating interest rate reductions and/or principal write-downs filing for Chapter 12 bankruptcy, or undertaking a full or partial liquidation. In this report, the commodity price increases needed to maintain the initial level of net worth are identified. If these price increases seem to be too high to expect for a given type of farm operation, perhaps a change in the production, marketing, or financial affairs of the farm should be considered

PROJECTED ECONOMIC SITUATIONS OF NORTH AND CENTRAL ILLINOIS CASH-GRAIN FARMS

Net farm income is projected four years into the future for farms under three tenure patterns (full owner, part owner, and full tenant) at three initial debt-to-asset levels (20, 50, and 70 percent). Assumptions about farm size, production costs, and capital asset values are based upon grain farms in northern and central Illinois whose operators participate in the Farm Business Farm Management (FBFM) record keeping service.

The farm scenario in these simulations consists of 651 tillable acres. The cropping pattern is 55 percent corn and set-aside (360 acres) and 45 percent soybeans (291 acres) each year. We assume that the farm participates in the 20

1 Funds for this project were provided in part by the Illinois Farm Legal Assistance Foundation.

percent set-aside program[2]. This results in 288 acres of corn and 72 acres of set-aside. The full owner is assumed to own all 651 acres. The part owner owns 325 acres and share-rents the rest on a 50:50 basis. The full tenant share-rents the entire 651 acres.

Production costs and land values are assumed to remain constant over the four-year period. Interest rates are assumed to be 10.5 percent on current- and intermediate-term debt and 10 percent on long-term debt. Commodity yields are 143 and 45 bushels per acre for corn and soybeans, respectively. This corn yield is also used to project government program benefits. The prices used to project net farm income are summarized in Table 1. Corn target prices are assumed to decline as set forth in the 1985 Farm Bill. Cash corn and soybean prices are assumed to increase slightly over the four-year period.

Table 1. Commodity Prices Used to Project the Financial Situations of Illinois Cash-Grain Farms

	Year			
	1988	1989	1990	1991
	-------dollars per bushel------			
Cash soybeans	5.25	5.45	5.65	5.85
Cash corn	1.75	1.80	1.85	1.90
Target price	2.97	2.88	2.75	2.75
Loan price	1.74	1.65	1.56	1.56
Deficiency payment rate	1.22	1.08	0.90	0.85

In these simulations, net farm income is projected each year of the four-year period. Off-farm income is $8,526 and family living expenses are $24,956 each year. These amounts reflect FBFM averages. Initial and end-of-year operating loan balances and net worth are reported for each farm, as is the ending debt-to-asset ratio. If net worth declines over the four-year period, the commodity price increases needed to maintain net worth are calculated. It is assumed that an increase in the price of corn by one cent is associated with an increase in the price of soybeans by 2.5 cents. Asset values are assumed to remain constant even though increases (particularly in land values) would be expected with increasing commodity prices.

North and Central Illinois Cash-Grain Farms with an Initial Debt-to-Asset Ratio of 20 Percent

Results of the four-year financial projections for north and central Illinois cash-grain farms with an initial debt-to-asset ratio of 20 percent are summarized in Table 2. Net farm income is strong and increasing for the full owner and part owner. Net farm income is good for the full tenant but not enough to cover family living expenses.

[2] As we went to press, there was some question about whether commodity price supports would be lowered or diverted acreage requirements increased. Either action would tend to lower the net income and net worth estimates contained in this report.

Table 2. Projected Financial Situations of Northern and Central Illinois Cash-Grain Farms with an Initial Debt-to-Asset Ratio of 20 Percent

	Tenure pattern		
	Full owner	Part owner	Full tenant
Net farm income			
1988	$38,794	$28,350	$17,537
1989	40,876	29,800	17,994
1990	40,194	28,334	16,402
1991	44,585	31,197	17,808
Operating loan balance			
Initial	$24,531	$18,898	$13,266
End-of-year			
1988	7,055	55	0
1989	668	0	0
1990	0	0	0
1991	0	0	0
Net worth			
Initial	$1,314,421	$810,149	$309,877
End-of-year			
1988	1,324,899	813,965	302,181
1989	1,337,460	819,232	298,941
1990	1,348,433	822,589	293,971
1991	1,364,094	829,258	290,892
Ending D/A ratio	0.16	0.17	0.23
Commodity price increases needed to maintain initial net worth ($/bu)			
Corn	——	——	$0.29
Soybeans	——	——	0.74

The initial operating loans of the full owner, part owner, and full tenant are eliminated in the third, second, and first year, respectively. An operating loan balance of zero indicates net farm income, non-farm income, and initial cash on hand is sufficient during the year to meet assumed family living and tax expenses, principal payments, and downpayments on capital purchases.

Net worth increases and the initial debt-to-asset ratio is reduced for the full and part owners. Net worth declines approximately $15,000 for the full tenant and the debt-to-asset ratio increases slightly. The commodity price increases needed to maintain net worth for the full tenant are $0.29 and $0.74 per bushel for corn and soybeans, respectively, in each year of the four-year period.

The results of the simulations of northern and central Illinois cash-grain farms with initial debt-to-asset ratios of 20 percent are very favorable for the full and part owners. Net farm income is strong and net worth is increasing. The full tenant experiences lower but stable net farm income. Net worth declines slightly and the debt-to-asset ratio increases to only 23 percent. These farms can clearly survive and prosper for an extended period of time without any significant changes in their farming operations.

North and Central Illinois Cash-Grain Farms with an Initial Debt-to-Asset Ratio of 50 Percent

Results of the four-year financial projections for north and central Illinois cash-grain farms with an initial debt-to-asset ratio of 50 percent are summarized in Table 3. Net farm income is negative each year for the full and part owners. The full tenant has positive net farm income, but it is very low. The operating loan balance increases each year of the four-year projection period regardless of tenure pattern. The high interest costs associated with these operations forces increased borrowing to meet family living expenses and scheduled principal payments.

Table 3. Projected Financial Situations of Northern and Central Illinois Cash-Grain Farms with an Initial Debt-to-Asset Ratio of 50 Percent

	Tenure pattern		
	Full owner	Part owner	Full tenant
Net Farm income			
1988	($10,921)	($ 2,413)	$5,728
1989	(12,947)	(3,424)	5,947
1990	(18,170)	(6,868)	4,151
1991	(18,631)	(6,699)	4,793
Operating loan balance			
Initial	$61,329	$47,246	$33,164
End-of-year			
1988	118,493	75,883	34,725
1989	190,855	118,702	49,238
1990	271,903	168,404	69,077
1991	357,196	221,693	91,558
Net worth			
Initial	$821,512	$506,342	$191,173
End-of-year			
1988	794,152	487,437	179,271
1989	764,766	467,522	167,589
1990	730,157	444,187	154,044
1991	695,087	421,049	141,641
Ending D/A ratio	0.57	0.57	0.60
Commodity price increases needed to maintain initial net worth ($/bu)			
Corn	$0.72	$0.71	$0.68
Soybeans	1.81	1.76	1.70

Table 5. Projected Financial Situations of Southern Illinois Cash-Grain Farms

	Initial debt-to-asset ratio		
	20 percent	50 percent	70 percent
Net farm income			
1988	$6,849	($13,216)	($26,593)
1989	6,980	(15,076)	(29,887)
1990	5,153	(19,104)	(35,501)
1991	5,952	(20,732)	(38,881)
Operating loan balance			
Initial	$14,219	$35,547	$49,766
End-of-year			
1988	7,086	63,988	102,941
1989	12,750	107,217	172,340
1990	23,476	157,668	250,547
1991	36,334	213,236	335,623
Net worth			
Initial	$526,931	$329,332	$197,599
End-of-year			
1988	515,808	299,676	154,568
1989	504,817	268,161	108,242
1990	491,958	232,618	56,302
1991	480,456	195,447	982
Ending D/A ratio	0.24	0.69	0.998
Commodity price increases needed to maintain initial net worth ($/bu)			
Corn	$0.64	$1.08	$1.38
Soybeans	1.60	2.71	3.45

The results of the simulations of southern Illinois cash-grain farms show how net farm income decreases as leverage increases. The farm with an initial debt-to-asset ratio of 20 percent could survive for an extended period of time, although net worth is decreasing. As the initial debt-to-asset ratio increases, this analysis suggests that some type of change should be considered to increase net farm income.

BUYING VERSUS LEASING LAND

Land values appear to be stabilizing and even increasing in some parts of Illinois. Some farm firms in good financial condition are beginning to consider land purchases. This section compares buying versus share leasing an additional 160 acres for the north and central Illinois part-owner farm scenario with an initial debt-to-asset ratio of 20 percent. The additional land is assumed to be identical in value, yield, and crop mix as the existing farm. The land purchase is 70 percent financed with a 30-year mortgage at 10 percent. There is also a machinery purchase associated with the additional acreage (in addition to normal capital replacement). Table 6 summarizes results of the simulations comparing no-change, share leasing, and purchasing land. These projections are made assuming constant land values

Table 6. North and Central Illinois Part Owner Cash-Grain with Initial 20 Percent Debt/Asset Ratio--Share Lease versus Land Purchase

	No-change	Share lease	Purchase
Net farm income			
1988	$ 28,350	$ 33,311	$22,102
1989	29,800	31,638	18,789
1990	28,334	32,801	19,684
1991	31,197	38,341	25,147
Operating loan balance			
Initial	$ 18,898	$ 18,898	$ 18,898
End-of-year			
1988	55	0	15,476
1989	0	0	16,039
1990	0	0	21,293
1991	0	0	27,663
Net worth			
Initial	$810,149	$810,149	$810,149
End-of-year			
1988	813,965	818,926	807,718
1989	819,232	824,517	803,880
1990	822,589	831,781	801,948
1991	829,258	844,230	805,206
Ending D/A ratio	0.17	0.17	0.34
Land value inflation rate needed per year for ending net worth of land-purchase scenario to equal ending net worth of:			
No-change scenario			1.97%
Share-lease scenario			3.14%

Net farm income is highest each year for the share-lease scenario and lowest for the purchase scenario. Net farm income increases from the no-change to the share-lease scenarios because the income from the additional land is higher than the increases in variable crop costs and interest costs (from the machinery purchase). Net farm income decreases from the no-change to the purchase scenarios because the additional revenue is not enough to meet additional variable crop costs and interest costs associated with the machinery and land purchases.

The operating loan balance is eliminated by the end of the first projection year in the share-lease scenario. It increases slightly over the projection period for the purchase scenario.

Net worth increases at a faster rate for the share lease versus the no-change scenario. The ending debt-to-asset ratio is the same at 17 percent. Net worth decreases in the first three years of the purchase scenario. It then increases in the last year to approximately $5,000 below the initial level.

Land values would need to increase 1.97 percent per year (from the original level of $1,850 per acre) for the ending net worth of the purchase scenario to equal the ending net worth of the no-change scenario. The land value increase needed per year to equate the ending net worth of the purchase and the share-lease scenarios is 3.1 percent.

The simulations in Table 6 indicate that share leasing additional acreage is preferred to purchasing under the assumptions of this analysis. Net farm income is higher, the need for an operating line of credit is eliminated, net worth is higher, and the ending debt-to-asset ratio is lower. However, share leasing provides little security in the long run. It is shown that land would need to inflate approximately three percent per year for the ending net worth of the purchase scenario to equal the ending net worth of the share lease scenario. The purchase decision may be preferred if farm operators are willing to accept the risks associated with lower net farm income, short-term borrowing, and increased leverage in order to gain the security associated with land ownership and the opportunities of (possible) capital gains.

The economic scenarios presented in this paper were developed with the use of the Farm Business and Financial Management Transition Planning model. The results presented here are based largely upon FBFM averages, but the model can be easily applied to specific farms or to assumptions which differ from those used in this paper. The model can be used on a microcomputer and is available through the IlliNet office. For more information call (217)333-9513.

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FARM ECONOMICS
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December 1987

87-18/The Projected Economic Outlook for Illinois Livestock Farms[1]

Livestock prices have been relatively strong in the last year, particularly for hogs and cattle. Resulting high returns to livestock enterprises have helped many Illinois farmers reduce debt and increase equity. This report projects the financial situation of typical Illinois hog, feeder-cattle finishing, and dairy farms under three initial debt-to-asset ratios (0.20, 0.50, and 0.70) and three different price scenarios (weak, moderate, and strong). Assumptions about farm size, production costs, crop mix, and livestock enterprises are based upon northern and central Illinois hog, beef, and dairy farms in the Farm Business Farm Management (FBFM) Association.

The economic situation of Illinois livestock farms is projected for 4 years--from 1988 through 1991. Production costs and land values are assumed to remain constant over the 4-year period. Capital is replaced each year to maintain existing capital stock. The interest rate on current and intermediate-term debt is assumed to be 10.5 percent, and an interest rate of 11.0 percent is assumed on long-term debt. In each scenario, off-farm income is assumed to be $8,526 and family living expenses are $24,965. Crop yields are assumed to be 143 and 45 bushels per acre for corn and soybeans, respectively, and 5 and 18 tons per acre for hay and corn silage, respectively. Each farm is assumed to participate in the 20-percent set-aside program[2]. The commodity, livestock, and feed prices used to project the economic situations of Illinois livestock farms are summarized in Table 1. These price estimates were chosen arbitrarily to reflect a range of possible outcomes and should not be viewed as actual forecasts of the future.

HOG FARMS

The hog farm in these scenarios consists of 357 acres, of which 179 acres are owned and 178 acres are rented on a 50-50 crop-share lease arrangement. The crop production consists of 230 acres of corn and set-aside and 127 acres of soybeans. The farm operator is assumed to own all livestock facilities and to farrow and finish 174 litters per year, with an average of 7.68 pigs weaned per litter. The results of the hog farm simulations are summarized in Table 2.

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[1]Funds for this project were provided in part by the Illinois Farm Legal Assistance Foundation.

[2]As we went to press, there was some question if commodity price supports would be lowered or diverted acreage requirements increased. Either action would tend to lower the net income and net worth estimates contained in this report

Table 1. Commodity Prices Used to Project the Financial Conditions of Illinois Livestock Farms

Commodity	Unit	Scenario	Year 1988	1989	1990	1991
Corn:						
Target price	bushel	All	$ 2.97	$ 2.88	$ 2.75	$ 2.75
Cash price	bushel	All	1.75	1.80	1.85	1.90
Loan price	bushel	All	1.74	1.65	1.56	1.56
Deficiency rate	bushel	All	1.22	1.08	0.90	0.85
Soybeans	bushel	All	5.25	5.45	5.65	5.85
Silage	ton	All	13.50	13.50	13.50	13.50
Hay	ton	All	50.00	50.00	50.00	50.00
Supplement	hundredweight	All	11.00	11.00	11.00	11.00
Feeder cattle	hundredweight	All	70.00	70.00	70.00	70.00
Veal calves	hundredweight	All	84.80	84.80	84.80	84.80
Cull cows	hundredweight	All	46.90	46.90	46.90	46.90
Cull sows	hundredweight	All	---$5.00 less than market price--			
Market hogs	hundredweight	Weak	36.00	36.00	36.00	36.00
		Moderate	40.00	40.00	40.00	40.00
		Strong	50.00	50.00	50.00	50.00
Live cattle	hundredweight	Weak	58.50	58.50	58.50	58.50
		Moderate	65.00	65.00	65.00	65.00
		Strong	71.50	71.50	71.50	71.50
Milk	hundredweight	Weak	10.82	10.82	10.82	10.82
		Moderate	11.50	11.50	11.50	11.50
		Strong	12.18	12.18	12.18	12.18

Weak Prices

Net farm income is good for the farm with an initial debt-to-asset ratio of 0.20. The operating loan balance is eliminated in the first year, net worth is relatively stable, and the debt-to-asset ratio decreases to 0.17. For the farms with initial debt-to-asset ratios of 0.50 and 0.70, net farm income is low or negative; the operating loan balance increases; and net worth declines each year.

Moderate Prices

Net farm income is strong for the farm with an initial debt-to-asset ratio of 0.20. The operating loan is repaid, net worth increases, and the ending debt-to-asset ratio is lower. Net farm income is in the range of $13,000 to $14,000 for the farm with an initial debt-to-asset ratio of 0.50. The operating loan balance increases and net worth decreases because net farm and off-farm income are not enough to meet family living expenses. The debt-to-asset ratio is still 50 percent at the end of the 4-year period. Net farm income is negative for the farm with an initial debt-to-asset ratio of 0.70; net worth decreases; and the debt-to-asset ratio increases.

Strong Prices

Net farm income is strong for the farms with initial debt-to-asset ratios of 0.20 and 0.50. The operating loan balance is eliminated in the first and third years

Table 2. Projected Financial Situations of Illinois Hog Farms

Scenario	Initial debt/asset (D/A) ratio 0.20	0.50	0.70
WEAK PRICES			
Net farm income, 1988	$ 23,749	$ 2,093	($12,345)
1989	24,253	1,589	(14,085)
1990	22,667	(608)	(17,942)
1991	23,926	(574)	(19,743)
Operating loan balance,			
Initial	$ 14,794	$ 36,985	$ 51,778
End-of-year, 1988	0	50,473	89,503
1989	0	74,981	142,283
1990	0	105,337	202,583
1991	0	139,547	268,627
Net worth,			
Initial	$568,120	$355,074	$213,045
End-of-year, 1988	565,614	337,669	184,166
1989	567,238	322,654	153,642
1990	567,122	305,454	119,261
1991	568,749	288,344	83,079
Ending D/A ratio	0.17	0.56	0.87
MODERATE PRICES			
Net farm income, 1988	$ 35,356	$ 13,700	($738)
1989	35,860	14,415	(1,259)
1990	34,274	13,261	(3,779)
1991	35,533	14,423	(4,102)
Operating loan balance,			
Initial	$ 14,794	$ 36,985	$ 51,778
End-of-year, 1988	0	38,866	77,896
1989	0	53,441	117,945
1990	0	73,052	164,164
1991	0	95,091	214,586
Net worth,			
Initial	$568,120	$355,074	$213,045
End-of-year, 1988	577,221	349,276	195,773
1989	586,827	344,194	177,980
1990	595,269	337,739	157,680
1991	606,258	332,799	137,120
Ending D/A ratio	0.17	0.50	0.79
STRONG PRICES			
Net farm income, 1988	$ 64,373	$ 42,717	$ 28,280
1989	64,877	46,479	30,805
1990	63,291	47,663	30,890
1991	64,550	51,111	33,364
Operating loan balance,			
Initial	$ 14,794	$ 36,985	$ 51,778
End-of-year, 1988	0	9,849	48,879
1989	0	2,159	64,115
1990	0	0	83,700
1991	0	0	104,781
Net Worth,			
Initial	$568,120	$355,074	$213,045
End-of-year, 1988	606,239	378,293	224,790
1989	635,526	395,476	231,810
1990	664,855	412,206	238,144
1991	697,216	431,869	246,926
Ending D/A ratio	0.15	0.35	0.63

for these farms, respectively. Net worth increases, and the debt-to-asset ratio decreases. Net farm income is also strong for the highly leveraged farm. Net worth increases, and the ending debt-to-asset ratio is reduced. However, the operating loan balance increases to meet the scheduled principal payments assumed in this scenario.

FEEDER-CATTLE FINISHING FARMS

The farm used to project the economic situations of Illinois feeder-cattle finishing farms consists of 444 acres, of which one-half is owned and the other half is rented on a 50-50 crop-share basis. Of this land, 345 acres are corn, set-aside, and corn silage; and 99 acres are soybeans. The farm operator is assumed to own all livestock facilities and to feed out 298 head of cattle per year. The results of the feeder-cattle finishing farm simulations are presented in Table 3.

Weak Prices

Net farm income is negative regardless of the initial debt-to-asset ratio. The weak price scenario implies a large price spread of $11.50 between feeder-cattle and fat-cattle prices. The operating loan balance increases, net worth decreases, and the ending debt-to-asset ratio is increased for each farm scenario. The farm with an initial debt-to-asset ratio of 0.70 is insolvent at the end of the fourth year under these weak prices.

Moderate Prices

Net farm income is low for the farm with an initial debt-to-asset ratio of 0.20. The operating loan balance decreases slightly, but net worth declines over the 4-year period. Net farm income is negative for the farms with initial debt-to-asset ratios of 0.50 and 0.70. The farm with an initial debt-to-asset ratio of 0.70 is nearly insolvent by the end of the fourth year.

Strong Prices

Net farm income is strong and the operating loan balance is eliminated by the end of the second year for the farm with initial debt-to-asset ratio of 0.20. Net worth increases and the debt-to-asset ratio is reduced. Net farm income is low or negative for the farms with more debt. Net worth declines, and the debt-to-asset ratio increases.

DAIRY FARMS

The farm used to project the economic situation of Illinois dairy operations consists of 265 acres, of which 132 acres are owned and 133 acres are rented on a 50-50 basis. Of this land, 180 acres of corn, set-aside, and corn silage, 33 acres of soybeans, and 52 acres of hay are produced. The farm operator is assumed to own all livestock facilities and to milk a herd of 56 cows per year, with average annual milk production of 15,369 pounds per cow. Calves not kept for replacement heifers are sold at 200 pounds as veal calves. Results of the dairy farm simulations are presented in Table 4.

Weak Prices

Net farm income is strong for the farm with an initial debt-to-asset ratio of 0.20. Net worth increases, and the debt-to-asset ratio is reduced. Net farm income is low for the farm with an initial debt-to-asset ratio of 0.50, and net

Table 3. Projected Financial Situations of Illinois Feeder Cattle Farms

Scenario	Initial debt/asset (D/A) ratio 0.70	0.50	0.70
WEAK PRICES			
Net farm income, 1988	($9,593)	($37,165)	($55,545)
1989	(12,400)	(42,619)	(62,963)
1990	(17,595)	(51,036)	(73,549)
1991	(19,424)	(56,426)	(81,337)
Operating loan balance,			
Initial	$46,381	$115,954	$162,335
End-of-year, 1988	48,747	163,129	241,273
1989	65,165	229,840	341,710
1990	91,182	309,372	457,137
1991	123,790	399,056	585,114
Net worth,			
Initial	$719,223	$449,513	$269,708
End-of-year, 1988	690,355	395,910	197,724
1989	661,516	336,852	118,322
1990	627,482	269,377	28,334
1991	591,620	196,512	(69,441)
Ending D/A ratio	0.31	0.77	1.08
MODERATE PRICES			
Net farm income, 1988	$11,116	($16,456)	($34,836)
1989	10,483	(19,735)	(40,079)
1990	7,394	(25,750)	(48,263)
1991	7,911	(28,485)	(53,395)
Operating loan balance,			
Initial	$46,381	$115,954	$162,335
End-of-year, 1988	28,038	142,421	220,564
1989	24,407	186,248	298,117
1990	28,077	240,494	388,258
1991	35,049	302,237	488,294
Net worth,			
Initial	$719,223	$449,513	$269,708
End-of-year, 1988	711,064	416,618	218,433
1989	402,274	380,444	161,915
1990	690,587	338,255	97,213
1991	680,361	293,331	27,379
Ending D/A Ratio	0.20	0 66	0_97
STRONG PRICES			
Net farm income, 1988	$31,825	$4,253	($14,127)
1989	33,367	3,148	(17,196)
1990	30,666	(545)	(22,977)
1991	31,568	(697)	(25,454)
Operating loan balance,			
Initial	$46,381	$115,954	$162,335
End-of-year, 1988	7,329	121,712	199,856
1989	0	143,429	254,526
1990	0	173,072	319,381
1991	0	207,126	391,475
Net worth,			
Initial	$719,223	$449,513	$269,708
End-of-year, 1988	731,773	437,327	239,141
1989	739,546	423,263	205,506
1990	744,147	405,677	166,090
1991	750,504	388,442	124,197
Ending D/A ratio	0 15	0.54	0 85

Table 4. Projected Financial Situations of Illinois Dairy Farms

Scenario	Initial debt/asset (D/A) ratio 0.20	0.50	0.70
WEAK PRICES			
Net farm income, 1988	$37,079	$15,575	$1,239
1989	37,489	16,163	698
1990	35,445	14,092	(2,753)
1991	37,905	15,931	(2,418)
Operating loan balance,			
Initial	$8,835	$22,089	$30,924
End-of-year, 1988	0	33,864	68,330
1989	0	56,435	118,909
1990	0	84,656	176,323
1991	0	114,057	236,967
Net worth,			
Initial	$562,142	$351,338	$210,803
End-of-year, 1988	570,558	345,945	194,919
1989	581,932	342,927	179,033
1990	591,384	337,658	159,711
1991	604,601	334,861	140,811
Ending D/A ratio	0.15	0.50	0.79
MODERATE PRICES			
Net farm income, 1988	$42,932	$21,428	$7,091
1989	43,342	22,630	7,165
1990	41,298	21,051	4,337
1991	43,757	23,413	5,357
Operating loan balance,			
Initial	$8,835	$22,089	$30,924
End-of-year, 1988	0	28,011	62,477
1989	0	45,901	107,128
1990	0	69,137	158,018
1991	0	93,180	211,065
Net worth,			
Initial	$562,142	$351,338	$210,803
End-of-year, 1988	576,410	351,798	200,772
1989	591,089	353,461	190,814
1990	604,351	353,177	178,016
1991	621,432	355,738	166,713
Ending D/A ratio	0.15	0.47	0.75
STRONG PRICES			
Net farm income, 1988	$48,784	$27,280	$12,944
1989	49,194	29,097	13,632
1990	47,150	28,009	11,351
1991	49,610	30,895	12,955
Operating loan balance,			
Initial	$8,835	$422,089	$30,924
End-of-year, 1988	0	22,159	56,625
1989	0	35,368	96,065
1990	0	53,619	141,394
1991	0	72,303	188,050
Net worth,			
Initial	$562,142	$351,338	$210,803
End-of-year, 1988	582,263	357,650	206,624
1989	600,393	363,994	201,877
1990	617,428	368,695	194,640
1991	638,378	376,614	189,728
Ending D/A ratio	0.15	0.43	0.72

worth declines slightly over the 4-year period. Net farm income is very low or negative for the farm with an initial debt-to-asset ratio of 0.70, and the ending debt-to-asset ratio is higher.

Moderate Prices

Net farm income is strong, and the net worth increases for the farm with an initial debt-to-asset ratio of 0.20. The farm with an initial debt-to-asset ratio of 0.50 has net farm income in the range of $21,000 to $23,000; and the net worth increases slightly over the 4-year period. The farm with an initial debt-to-asset ratio of 0.70 has positive but very low net farm income, and the net worth declines.

Strong Prices

The farms with initial debt-to-asset ratios of 0.20 and 0.50 have strong net farm income and increase net worth over the 4-year period. However, the farm with an initial debt-to-asset ratio of 0.50 increases the operating loan balance to meet scheduled principal payments. The farm with an initial debt-to-asset ratio of 0.70 has low net farm income, and the net worth declines. The debt-to-asset ratio increases slightly even with strong milk prices.

CONCLUDING REMARKS

The economic scenarios presented in this paper were developed with the use of the Farm Business and Financial Management Transition Planning model. The results presented here are based largely upon FBFM averages, but the model can be easily applied to specific farms or to assumptions that differ from those used in this paper. The model can be used on a microcomputer and is available through the IlliNet office.

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